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(54) Title: COMPOSITIONS AND METHODS FOR THE THERAPY AND DIAGNOSIS OF LUNG CANCER

(57) **Abstract:** Compositions and methods for the therapy and diagnosis of cancer, such as lung cancer, are disclosed. Compositions may comprise one or more lung tumor proteins, immunogenic portions thereof, or polynucleotides that encode such portions. Alternatively, a therapeutic composition may comprise an antigen presenting cell that expresses a lung tumor protein, or a T cell that is specific for cells expressing such a protein. Such compositions may be used, for example, for the prevention and treatment of diseases such as lung cancer. Diagnostic methods based on detecting a lung tumor protein, or mRNA encoding such a protein, in a sample are also provided.

COMPOSITIONS AND METHODS FOR THE THERAPY AND DIAGNOSIS OF LUNG CANCER

TECHNICAL FIELD OF THE INVENTION

The present invention relates generally to therapy and diagnosis of cancer, such as lung cancer. The invention is more specifically related to polypeptides comprising at least a portion of a lung tumor protein, and to polynucleotides encoding such polypeptides. Such polypeptides and polynucleotides may be used in compositions for prevention and treatment of lung cancer, and for the diagnosis and monitoring of such cancers.

BACKGROUND OF THE INVENTION

Cancer is a significant health problem throughout the world. Although advances have been made in detection and therapy of cancer, no vaccine or other universally successful method for prevention or treatment is currently available. Current therapies, which are generally based on a combination of chemotherapy or surgery and radiation, continue to prove inadequate in many patients.

Lung cancer is the primary cause of cancer death among both men and women in the U.S., with an estimated 172,000 new cases being reported in 1994. The five-year survival rate among all lung cancer patients, regardless of the stage of disease at diagnosis, is only 13%. This contrasts with a five-year survival rate of 46% among cases detected while the disease is still localized. However, only 16% of lung cancers are discovered before the disease has spread.

Early detection is difficult since clinical symptoms are often not seen until the disease has reached an advanced stage. Currently, diagnosis is aided by the use of chest x-rays, analysis of the type of cells contained in sputum and fiberoptic examination of the bronchial passages. Treatment regimens are determined by the type and stage of the cancer, and include surgery, radiation therapy and/or chemotherapy.

In spite of considerable research into therapies for this and other cancers, lung cancer remains difficult to diagnose and treat effectively. Accordingly, there is a

need in the art for improved methods for detecting and treating such cancers. The present invention fulfills these needs and further provides other related advantages.

SUMMARY OF THE INVENTION

Briefly stated, the present invention provides compositions and methods for the diagnosis and therapy of cancer, such as lung cancer. In one aspect, the present invention provides polypeptides comprising at least a portion of a lung tumor protein, or a variant thereof. Certain portions and other variants are immunogenic, such that the ability of the variant to react with antigen-specific antisera is not substantially diminished. Within certain embodiments, the polypeptide comprises a sequence that is encoded by a polynucleotide sequence selected from the group consisting of: (a) sequences recited in SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826; (b) variants of a sequence recited in SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826; and (c) complements of a sequence of (a) or (b). In specific embodiments, the polypeptides of the present invention comprise at least a portion of a tumor protein that includes an amino acid sequence selected from the group consisting of sequences recited in SEQ ID NO: 786, 787, 791, 793, 795, 797-799, 806, 809 and 827, and variants thereof.

The present invention further provides polynucleotides that encode a polypeptide as described above, or a portion thereof (such as a portion encoding at least

15 amino acid residues of a lung tumor protein), expression vectors comprising such polynucleotides and host cells transformed or transfected with such expression vectors.

Within other aspects, the present invention provides pharmaceutical compositions comprising a polypeptide or polynucleotide as described above and a physiologically acceptable carrier.

Within a related aspect of the present invention, vaccines, or immunogenic compositions, for prophylactic or therapeutic use are provided. Such vaccines comprise a polypeptide or polynucleotide as described above and an immunostimulant.

The present invention further provides pharmaceutical compositions that comprise: (a) an antibody or antigen-binding fragment thereof that specifically binds to a lung tumor protein; and (b) a physiologically acceptable carrier.

Within further aspects, the present invention provides pharmaceutical compositions comprising: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) a pharmaceutically acceptable carrier or excipient. Antigen presenting cells include dendritic cells, macrophages, monocytes, fibroblasts and B cells.

Within related aspects, vaccines, or immunogenic compositions, are provided that comprise: (a) an antigen presenting cell that expresses a polypeptide as described above and (b) an immunostimulant.

The present invention further provides, in other aspects, fusion proteins that comprise at least one polypeptide as described above, as well as polynucleotides encoding such fusion proteins.

Within related aspects, pharmaceutical compositions comprising a fusion protein, or a polynucleotide encoding a fusion protein, in combination with a physiologically acceptable carrier are provided.

Vaccines, or immunogenic compositions, are further provided, within other aspects, that comprise a fusion protein, or a polynucleotide encoding a fusion protein, in combination with an immunostimulant.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a

patient a pharmaceutical composition or immunogenic composition as recited above. The patient may be afflicted with lung cancer, in which case the methods provide treatment for the disease, or patient considered at risk for such a disease may be treated prophylactically.

The present invention further provides, within other aspects, methods for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a lung tumor protein, wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the protein from the sample.

Within related aspects, methods are provided for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated as described above.

Methods are further provided, within other aspects, for stimulating and/or expanding T cells specific for a lung tumor protein, comprising contacting T cells with one or more of: (i) a polypeptide as described above; (ii) a polynucleotide encoding such a polypeptide; and/or (iii) an antigen presenting cell that expresses such a polypeptide; under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells. Isolated T cell populations comprising T cells prepared as described above are also provided.

Within further aspects, the present invention provides methods for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population as described above.

The present invention further provides methods for inhibiting the development of a cancer in a patient, comprising the steps of: (a) incubating $CD4^+$ and/or $CD8^+$ T cells isolated from a patient with one or more of: (i) a polypeptide comprising at least an immunogenic portion of a lung tumor protein; (ii) a polynucleotide encoding such a polypeptide; and (iii) an antigen-presenting cell that expressed such a polypeptide; and (b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient. Proliferated cells may, but need not, be cloned prior to administration to the patient.

Within further aspects, the present invention provides methods for determining the presence or absence of a cancer in a patient, comprising: (a) contacting a biological sample obtained from a patient with a binding agent that binds to a polypeptide as recited above; (b) detecting in the sample an amount of polypeptide that binds to the binding agent; and (c) comparing the amount of polypeptide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within preferred embodiments, the binding agent is an antibody, more preferably a monoclonal antibody. The cancer may be lung cancer.

The present invention also provides, within other aspects, methods for monitoring the progression of a cancer in a patient. Such methods comprise the steps of: (a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a polypeptide as recited above; (b) detecting in the sample an amount of polypeptide that binds to the binding agent; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amount of polypeptide detected in step (c) with the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

The present invention further provides, within other aspects, methods for determining the presence or absence of a cancer in a patient, comprising the steps of: (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a lung tumor protein; (b) detecting in the sample a level of a polynucleotide, preferably mRNA, that hybridizes to the oligonucleotide; and (c) comparing the level of polynucleotide that hybridizes to the oligonucleotide with a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient. Within certain embodiments, the amount of mRNA is detected via polymerase chain reaction using, for example, at least one oligonucleotide primer that hybridizes to a polynucleotide encoding a polypeptide as recited above, or a complement of such a polynucleotide. Within other embodiments, the amount of mRNA is detected using a hybridization technique, employing an oligonucleotide probe that hybridizes to a polynucleotide that encodes a polypeptide as recited above, or a complement of such a polynucleotide.

In related aspects, methods are provided for monitoring the progression of a cancer in a patient, comprising the steps of: (a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a lung tumor protein; (b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; (c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and (d) comparing the amount of polynucleotide detected in step (c) with the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

Within further aspects, the present invention provides antibodies, such as monoclonal antibodies, that bind to a polypeptide as described above, as well as diagnostic kits comprising such antibodies. Diagnostic kits comprising one or more oligonucleotide probes or primers as described above are also provided.

These and other aspects of the present invention will become apparent upon reference to the following detailed description and attached drawings. All references disclosed herein are hereby incorporated by reference in their entirety as if each was incorporated individually.

SEQUENCE IDENTIFIERS

SEQ ID NO: 1 is the determined cDNA sequence for clone #19038, also referred to as L845P.

SEQ ID NO: 2 is the determined cDNA sequence for clone #19036.

SEQ ID NO: 3 is the determined cDNA sequence for clone #19034.

SEQ ID NO: 4 is the determined cDNA sequence for clone #19033.

SEQ ID NO: 5 is the determined cDNA sequence for clone #19032.

SEQ ID NO: 6 is the determined cDNA sequence for clone #19030, also referred to as L559S.

SEQ ID NO: 7 is the determined cDNA sequence for clone #19029.

SEQ ID NO: 8 is the determined cDNA sequence for clone #19025.

SEQ ID NO: 9 is the determined cDNA sequence for clone #19023.

SEQ ID NO: 10 is the determined cDNA sequence for clone #18929.

SEQ ID NO: 11 is the determined cDNA sequence for clone #19010.

SEQ ID NO: 12 is the determined cDNA sequence for clone #19009.

SEQ ID NO: 13 is the determined cDNA sequence for clones #19005, 19007, 19016 and 19017.

SEQ ID NO: 14 is the determined cDNA sequence for clone #19004.

SEQ ID NO: 15 is the determined cDNA sequence for clones #19002 and 18965.

SEQ ID NO: 16 is the determined cDNA sequence for clone #18998.

SEQ ID NO: 17 is the determined cDNA sequence for clone #18997.

SEQ ID NO: 18 is the determined cDNA sequence for clone #18996.

SEQ ID NO: 19 is the determined cDNA sequence for clone #18995.

SEQ ID NO: 20 is the determined cDNA sequence for clone #18994, also known as L846P.

SEQ ID NO: 21 is the determined cDNA sequence for clone #18992.

SEQ ID NO: 22 is the determined cDNA sequence for clone #18991.

SEQ ID NO: 23 is the determined cDNA sequence for clone #18990, also referred to as clone #20111.

SEQ ID NO: 24 is the determined cDNA sequence for clone #18987.

SEQ ID NO: 25 is the determined cDNA sequence for clone #18985, also referred as L839P.

SEQ ID NO: 26 is the determined cDNA sequence for clone #18984, also referred to as L847P.

SEQ ID NO: 27 is the determined cDNA sequence for clone #18983.

SEQ ID NO: 28 is the determined cDNA sequence for clones #18976 and 18980.

SEQ ID NO: 29 is the determined cDNA sequence for clone #18975.

SEQ ID NO: 30 is the determined cDNA sequence for clone #18974.

SEQ ID NO: 31 is the determined cDNA sequence for clone #18973.

SEQ ID NO: 32 is the determined cDNA sequence for clone #18972.

SEQ ID NO: 33 is the determined cDNA sequence for clone #18971, also referred to as L801P.

SEQ ID NO: 34 is the determined cDNA sequence for clone #18970.

SEQ ID NO: 35 is the determined cDNA sequence for clone #18966.

SEQ ID NO: 36 is the determined cDNA sequence for clones #18964, 18968 and 19039.

SEQ ID NO: 37 is the determined cDNA sequence for clone #18960.

SEQ ID NO: 38 is the determined cDNA sequence for clone #18959.

SEQ ID NO: 39 is the determined cDNA sequence for clones #18958 and 18982.

SEQ ID NO: 40 is the determined cDNA sequence for clones #18956 and 19015.

SEQ ID NO: 41 is the determined cDNA sequence for clone #18954, also referred to L848P.

SEQ ID NO: 42 is the determined cDNA sequence for clone #18951.

SEQ ID NO: 43 is the determined cDNA sequence for clone #18950.

SEQ ID NO: 44 is the determined cDNA sequence for clones #18949 and 19024, also referred to as L844P.

SEQ ID NO: 45 is the determined cDNA sequence for clone #18948.

SEQ ID NO: 46 is the determined cDNA sequence for clone #18947, also referred to as L840P.

SEQ ID NO: 47 is the determined cDNA sequence for clones #18946, 18953, 18969 and 19027.

SEQ ID NO: 48 is the determined cDNA sequence for clone #18942.

SEQ ID NO: 49 is the determined cDNA sequence for clone #18940, 18962, 18963, 19006, 19008, 19000, and 19031.

SEQ ID NO: 50 is the determined cDNA sequence for clone #18939.

SEQ ID NO: 51 is the determined cDNA sequence for clones #18938 and 18952.

SEQ ID NO: 52 is the determined cDNA sequence for clone #18938.

SEQ ID NO: 53 is the determined cDNA sequence for clone #18937.

SEQ ID NO: 54 is the determined cDNA sequence for clones #18934, 18935, 18993 and 19022, also referred to as L548S.

SEQ ID NO: 55 is the determined cDNA sequence for clone #18932.

SEQ ID NO: 56 is the determined cDNA sequence for clones #18931 and 18936.

SEQ ID NO: 57 is the determined cDNA sequence for clone #18930.

SEQ ID NO: 58 is the determined cDNA sequence for clone #19014, also referred to as L773P.

SEQ ID NO: 59 is the determined cDNA sequence for clone #19127.

SEQ ID NO: 60 is the determined cDNA sequence for clones #19057 and 19064.

SEQ ID NO: 61 is the determined cDNA sequence for clone #19122.

SEQ ID NO: 62 is the determined cDNA sequence for clones #19120 and 18121.

SEQ ID NO: 63 is the determined cDNA sequence for clone #19118.

SEQ ID NO: 64 is the determined cDNA sequence for clone #19117.

SEQ ID NO: 65 is the determined cDNA sequence for clone #19116.

SEQ ID NO: 66 is the determined cDNA sequence for clone #19114.

SEQ ID NO: 67 is the determined cDNA sequence for clone #19112, also known as L561S.

SEQ ID NO: 68 is the determined cDNA sequence for clone #19110.

SEQ ID NO: 69 is the determined cDNA sequence for clone #19107, also referred to as L552S.

SEQ ID NO: 70 is the determined cDNA sequence for clone #19106, also referred to as L547S.

SEQ ID NO: 71 is the determined cDNA sequence for clones #19105 and 19111.

SEQ ID NO: 72 is the determined cDNA sequence for clone #19099.

SEQ ID NO: 73 is the determined cDNA sequence for clones #19095, 19104 and 19125, also referred to as L549S.

SEQ ID NO: 74 is the determined cDNA sequence for clone #19094.

SEQ ID NO: 75 is the determined cDNA sequence for clones #19089 and 19101.

SEQ ID NO: 76 is the determined cDNA sequence for clone #19088.

SEQ ID NO: 77 is the determined cDNA sequence for clones #19087, 19092, 19096, 19100 and 19119.

SEQ ID NO: 78 is the determined cDNA sequence for clone #19086.

SEQ ID NO: 79 is the determined cDNA sequence for clone #19085, also referred to as L550S.

SEQ ID NO: 80 is the determined cDNA sequence for clone #19084, also referred to as clone #19079.

SEQ ID NO: 81 is the determined cDNA sequence for clone #19082.

SEQ ID NO: 82 is the determined cDNA sequence for clone #19080.

SEQ ID NO: 83 is the determined cDNA sequence for clone #19077.

SEQ ID NO: 84 is the determined cDNA sequence for clone #19076, also referred to as L551S.

SEQ ID NO: 85 is the determined cDNA sequence for clone #19074, also referred to as clone #20102.

SEQ ID NO: 86 is the determined cDNA sequence for clone #19073, also referred to as L560S.

SEQ ID NO: 87 is the determined cDNA sequence for clones #19072 and 19115.

SEQ ID NO: 88 is the determined cDNA sequence for clone #19071.

SEQ ID NO: 89 is the determined cDNA sequence for clone #19070.

SEQ ID NO: 90 is the determined cDNA sequence for clone #19069.

SEQ ID NO: 91 is the determined cDNA sequence for clone #19068, also referred to L563S.

SEQ ID NO: 92 is the determined cDNA sequence for clone #19066.

SEQ ID NO: 93 is the determined cDNA sequence for clone #19065.

SEQ ID NO: 94 is the determined cDNA sequence for clone #19063.

SEQ ID NO: 95 is the determined cDNA sequence for clones #19061, 19081, 19108 and 19109.

SEQ ID NO: 96 is the determined cDNA sequence for clones #19060, 19067 and 19083, also referred to as L548S.

SEQ ID NO: 97 is the determined cDNA sequence for clones #19059 and 19062.

SEQ ID NO: 98 is the determined cDNA sequence for clone #19058.

SEQ ID NO: 99 is the determined cDNA sequence for clone #19124.

SEQ ID NO: 100 is the determined cDNA sequence for clone #18929.

SEQ ID NO: 101 is the determined cDNA sequence for clone #18422.

SEQ ID NO: 102 is the determined cDNA sequence for clone #18425.

SEQ ID NO: 103 is the determined cDNA sequence for clone #18431.

SEQ ID NO: 104 is the determined cDNA sequence for clone #18433.

SEQ ID NO: 105 is the determined cDNA sequence for clone #18444.

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SEQ ID NO: 150 is the determined cDNA sequence for clone #19132.2.

SEQ ID NO: 151 is the determined cDNA sequence for clone #19133.

SEQ ID NO: 152 is the determined cDNA sequence for clone #19134.2.

SEQ ID NO: 153 is the determined cDNA sequence for clone #19135.2.

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SEQ ID NO: 155 is a first determined cDNA sequence for clone #19138.1.

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SEQ ID NO: 163 is a first determined cDNA sequence for clone #19145.1.

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SEQ ID NO: 166 is the determined cDNA sequence for clone #19149.1.

SEQ ID NO: 167 is the determined cDNA sequence for clone #19152.

SEQ ID NO: 168 is a first determined cDNA sequence for clone #19153.1.

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SEQ ID NO: 177 is the determined cDNA sequence for clone #19166.

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SEQ ID NO: 179 is the determined cDNA sequence for clone #19171.

SEQ ID NO: 180 is a first determined cDNA sequence for clone #19173.1.

SEQ ID NO: 181 is a second determined cDNA sequence for clone #19173.2.

SEQ ID NO: 182 is the determined cDNA sequence for clone #19174.1.

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SEQ ID NO: 186 is the determined cDNA sequence for clone #19179.1.

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SEQ ID NO: 190 is a second determined cDNA sequence for clone #19182.2.

SEQ ID NO: 191 is the determined cDNA sequence for clone #19183.1.

SEQ ID NO: 192 is the determined cDNA sequence for clone #19185.1.

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SEQ ID NO: 202 is a first determined cDNA sequence for clone #19200.1.

SEQ ID NO: 203 is a second determined cDNA sequence for clone #19200.2.

~~SEQ ID NO: 204 is the determined cDNA sequence for clone #19202.~~

SEQ ID NO: 205 is a first determined cDNA sequence for clone #19204.1.

SEQ ID NO: 206 is a second determined cDNA sequence for clone #19204.2.

SEQ ID NO: 207 is the determined cDNA sequence for clone #19205.

SEQ ID NO: 208 is a first determined cDNA sequence for clone #19206.1.

SEQ ID NO: 209 is a second determined cDNA sequence for clone #19206.2.

SEQ ID NO: 210 is the determined cDNA sequence for clone #19207.

SEQ ID NO: 211 is the determined cDNA sequence for clone #19208.

SEQ ID NO: 212 is a first determined cDNA sequence for clone #19211.1.

SEQ ID NO: 213 is a second determined cDNA sequence for clone #19211.2.

SEQ ID NO: 214 is a first determined cDNA sequence for clone #19214.1.

SEQ ID NO: 215 is a second determined cDNA sequence for clone #19214.2.

SEQ ID NO: 216 is the determined cDNA sequence for clone #19215.

SEQ ID NO: 217 is a first determined cDNA sequence for clone #19217. 2.

SEQ ID NO: 218 is a second determined cDNA sequence for clone #19217.2.

SEQ ID NO: 219 is a first determined cDNA sequence for clone #19218.1.

SEQ ID NO: 220 is a second determined cDNA sequence for clone #19218.2.

SEQ ID NO: 221 is a first determined cDNA sequence for clone #19220.1.

SEQ ID NO: 222 is a second determined cDNA sequence for clone #19220.2.

SEQ ID NO: 223 is the determined cDNA sequence for clone #22015.

SEQ ID NO: 224 is the determined cDNA sequence for clone #22017.

SEQ ID NO: 225 is the determined cDNA sequence for clone #22019.

SEQ ID NO: 226 is the determined cDNA sequence for clone #22020.

SEQ ID NO: 227 is the determined cDNA sequence for clone #22023.

SEQ ID NO: 228 is the determined cDNA sequence for clone #22026.

SEQ ID NO: 229 is the determined cDNA sequence for clone #22027.

SEQ ID NO: 230 is the determined cDNA sequence for clone #22028.

SEQ ID NO: 231 is the determined cDNA sequence for clone #22032.

SEQ ID NO: 232 is the determined cDNA sequence for clone #22037.

SEQ ID NO: 233 is the determined cDNA sequence for clone #22045.

SEQ ID NO: 234 is the determined cDNA sequence for clone #22048.

SEQ ID NO: 235 is the determined cDNA sequence for clone #22050.

SEQ ID NO: 236 is the determined cDNA sequence for clone #22052.

SEQ ID NO: 237 is the determined cDNA sequence for clone #22053.

SEQ ID NO: 238 is the determined cDNA sequence for clone #22057.

SEQ ID NO: 239 is the determined cDNA sequence for clone #22066.

SEQ ID NO: 240 is the determined cDNA sequence for clone #22077.

SEQ ID NO: 241 is the determined cDNA sequence for clone #22085.

SEQ ID NO: 242 is the determined cDNA sequence for clone #22105.

SEQ ID NO: 243 is the determined cDNA sequence for clone #22108.

SEQ ID NO: 244 is the determined cDNA sequence for clone #22109.

SEQ ID NO: 245 is the determined cDNA sequence for clone #24842.

SEQ ID NO: 246 is the determined cDNA sequence for clone #24843.

SEQ ID NO: 247 is the determined cDNA sequence for clone #24845.

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SEQ ID NO: 253 is the determined cDNA sequence for clone #24860.
SEQ ID NO: 254 is the determined cDNA sequence for clone #24864.
SEQ ID NO: 255 is the determined cDNA sequence for clone #24866.
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SEQ ID NO: 257 is the determined cDNA sequence for clone #24868.
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SEQ ID NO: 259 is the determined cDNA sequence for clone #24870.
SEQ ID NO: 260 is the determined cDNA sequence for clone #24872.
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SEQ ID NO: 264 is the determined cDNA sequence for clone #24885.
SEQ ID NO: 265 is the determined cDNA sequence for clone #24886.
SEQ ID NO: 266 is the determined cDNA sequence for clone #24887.
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SEQ ID NO: 268 is the determined cDNA sequence for clone #24890.
SEQ ID NO: 269 is the determined cDNA sequence for clone #24896.
SEQ ID NO: 270 is the determined cDNA sequence for clone #24897.
SEQ ID NO: 271 is the determined cDNA sequence for clone #24899.
SEQ ID NO: 272 is the determined cDNA sequence for clone #24901.
SEQ ID NO: 273 is the determined cDNA sequence for clone #24902.
SEQ ID NO: 274 is the determined cDNA sequence for clone #24906.
SEQ ID NO: 275 is the determined cDNA sequence for clone #24912.
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SEQ ID NO: 279 is the determined cDNA sequence for clone #24930.
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SEQ ID NO: 286 is the determined cDNA sequence for clone #26956.
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SEQ ID NO: 288 is the determined cDNA sequence for clone #26961.
SEQ ID NO: 289 is the determined cDNA sequence for clone #26962.
SEQ ID NO: 290 is the determined cDNA sequence for clone #26964.
SEQ ID NO: 291 is the determined cDNA sequence for clone #26966.
SEQ ID NO: 292 is the determined cDNA sequence for clone #26968.
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SEQ ID NO: 294 is the determined cDNA sequence for clone #26973.
SEQ ID NO: 295 is the determined cDNA sequence for clone #26974.
SEQ ID NO: 296 is the determined cDNA sequence for clone #26976.
SEQ ID NO: 297 is the determined cDNA sequence for clone #26977.
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SEQ ID NO: 303 is the determined cDNA sequence for clone #26986.
SEQ ID NO: 304 is the determined cDNA sequence for clone #26993.
SEQ ID NO: 305 is the determined cDNA sequence for clone #26994.
SEQ ID NO: 306 is the determined cDNA sequence for clone #26995.
SEQ ID NO: 307 is the determined cDNA sequence for clone #27003.
SEQ ID NO: 308 is the determined cDNA sequence for clone #27005.
SEQ ID NO: 309 is the determined cDNA sequence for clone #27010.

SEQ ID NO: 310 is the determined cDNA sequence for clone #27011.

SEQ ID NO: 311 is the determined cDNA sequence for clone #27013.

SEQ ID NO: 312 is the determined cDNA sequence for clone #27016

SEQ ID NO: 313 is the determined cDNA sequence for clone #27017.

SEQ ID NO: 314 is the determined cDNA sequence for clone #27019.

SEQ ID NO: 315 is the determined cDNA sequence for clone #27028.

SEQ ID NO: 316 is the full-length cDNA sequence for clone #19060.

SEQ ID NO: 317 is the full-length cDNA sequence for clone #18964.

SEQ ID NO: 318 is the full-length cDNA sequence for clone #18929.

SEQ ID NO: 319 is the full-length cDNA sequence for clone #18991.

SEQ ID NO: 320 is the full-length cDNA sequence for clone #18996.

SEQ ID NO: 321 is the full-length cDNA sequence for clone #18966.

SEQ ID NO: 322 is the full-length cDNA sequence for clone #18951.

SEQ ID NO: 323 is the full-length cDNA sequence for clone #18973 (also known as L516S).

SEQ ID NO: 324 is the amino acid sequence for clone #19060.

SEQ ID NO: 325 is the amino acid sequence for clone #19063.

SEQ ID NO: 326 is the amino acid sequence for clone #19077.

SEQ ID NO: 327 is the amino acid sequence for clone #19110.

SEQ ID NO: 328 is the amino acid sequence for clone #19122.

SEQ ID NO: 329 is the amino acid sequence for clone #19118.

SEQ ID NO: 330 is the amino acid sequence for clone #19080.

SEQ ID NO: 331 is the amino acid sequence for clone #19127.

SEQ ID NO: 332 is the amino acid sequence for clone #19117.

SEQ ID NO: 333 is the amino acid sequence for clone #19095, also referred to L549S.

SEQ ID NO: 334 is the amino acid sequence for clone #18964.

SEQ ID NO: 335 is the amino acid sequence for clone #18929.

SEQ ID NO: 336 is the amino acid sequence for clone #18991.

SEQ ID NO: 337 is the amino acid sequence for clone #18996.

SEQ ID NO: 338 is the amino acid sequence for clone #18966.

SEQ ID NO: 339 is the amino acid sequence for clone #18951.

SEQ ID NO: 340 is the amino acid sequence for clone #18973.

SEQ ID NO: 341 is the determined cDNA sequence for clone 26461.

SEQ ID NO: 342 is the determined cDNA sequence for clone 26462.

SEQ ID NO: 343 is the determined cDNA sequence for clone 26463.

SEQ ID NO: 344 is the determined cDNA sequence for clone 26464.

SEQ ID NO: 345 is the determined cDNA sequence for clone 26465.

SEQ ID NO: 346 is the determined cDNA sequence for clone 26466.

SEQ ID NO: 347 is the determined cDNA sequence for clone 26467.

SEQ ID NO: 348 is the determined cDNA sequence for clone 26468.

SEQ ID NO: 349 is the determined cDNA sequence for clone 26469.

SEQ ID NO: 350 is the determined cDNA sequence for clone 26470.

SEQ ID NO: 351 is the determined cDNA sequence for clone 26471.

SEQ ID NO: 352 is the determined cDNA sequence for clone 26472.

SEQ ID NO: 353 is the determined cDNA sequence for clone 26474.

SEQ ID NO: 354 is the determined cDNA sequence for clone 26475.

SEQ ID NO: 355 is the determined cDNA sequence for clone 26476.

SEQ ID NO: 356 is the determined cDNA sequence for clone 26477.

SEQ ID NO: 357 is the determined cDNA sequence for clone 26478.

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SEQ ID NO: 359 is the determined cDNA sequence for clone 26480.

SEQ ID NO: 360 is the determined cDNA sequence for clone 26481.

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SEQ ID NO: 362 is the determined cDNA sequence for clone 26483.

SEQ ID NO: 363 is the determined cDNA sequence for clone 26484.

SEQ ID NO: 364 is the determined cDNA sequence for clone 26485.

SEQ ID NO: 365 is the determined cDNA sequence for clone 26486.

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SEQ ID NO: 367 is the determined cDNA sequence for clone 26488.

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SEQ ID NO: 370 is the determined cDNA sequence for clone 26491.

SEQ ID NO: 371 is the determined cDNA sequence for clone 26492.

SEQ ID NO: 372 is the determined cDNA sequence for clone 26493.

SEQ ID NO: 373 is the determined cDNA sequence for clone 26494.

SEQ ID NO: 374 is the determined cDNA sequence for clone 26495.

SEQ ID NO: 375 is the determined cDNA sequence for clone 26496.

SEQ ID NO: 376 is the determined cDNA sequence for clone 26497.

SEQ ID NO: 377 is the determined cDNA sequence for clone 26498.

SEQ ID NO: 378 is the determined cDNA sequence for clone 26499.

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SEQ ID NO: 380 is the determined cDNA sequence for clone 26501.

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SEQ ID NO: 383 is the determined cDNA sequence for clone 26504.

SEQ ID NO: 384 is the determined cDNA sequence for clone 26505.

SEQ ID NO: 385 is the determined cDNA sequence for clone 26506.

SEQ ID NO: 386 is the determined cDNA sequence for clone 26507.

SEQ ID NO: 387 is the determined cDNA sequence for clone 26508.

SEQ ID NO: 388 is the determined cDNA sequence for clone 26509.

SEQ ID NO: 389 is the determined cDNA sequence for clone 26511.

SEQ ID NO: 390 is the determined cDNA sequence for clone 26513.

SEQ ID NO: 391 is the determined cDNA sequence for clone 26514.

SEQ ID NO: 392 is the determined cDNA sequence for clone 26515.

SEQ ID NO: 393 is the determined cDNA sequence for clone 26516.

SEQ ID NO: 394 is the determined cDNA sequence for clone 26517.

SEQ ID NO: 395 is the determined cDNA sequence for clone 26518.

SEQ ID NO: 396 is the determined cDNA sequence for clone 26519.

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SEQ ID NO: 444 is the determined cDNA sequence for clone 27649.

SEQ ID NO: 445 is the determined cDNA sequence for clone 27650.

SEQ ID NO: 446 is the determined cDNA sequence for clone 27651.

SEQ ID NO: 447 is the determined cDNA sequence for clone 27652.

SEQ ID NO: 448 is the determined cDNA sequence for clone 27654.

SEQ ID NO: 449 is the determined cDNA sequence for clone 27655.

SEQ ID NO: 450 is the determined cDNA sequence for clone 27657.

SEQ ID NO: 451 is the determined cDNA sequence for clone 27659.

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SEQ ID NO: 453 is the determined cDNA sequence for clone 27666.

SEQ ID NO: 454 is the determined cDNA sequence for clone 27668.

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SEQ ID NO: 457 is the determined cDNA sequence for clone 27672.

SEQ ID NO: 458 is the determined cDNA sequence for clone 27674.

SEQ ID NO: 459 is the determined cDNA sequence for clone 27677.

SEQ ID NO: 460 is the determined cDNA sequence for clone 27681.

SEQ ID NO: 461 is the determined cDNA sequence for clone 27682.

SEQ ID NO: 462 is the determined cDNA sequence for clone 27683.

SEQ ID NO: 463 is the determined cDNA sequence for clone 27686.

SEQ ID NO: 464 is the determined cDNA sequence for clone 27688.

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SEQ ID NO: 467 is the determined cDNA sequence for clone 27693.

SEQ ID NO: 468 is the determined cDNA sequence for clone 27699.

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SEQ ID NO: 470 is the determined cDNA sequence for clone 27702.

SEQ ID NO: 471 is the determined cDNA sequence for clone 27705.

SEQ ID NO: 472 is the determined cDNA sequence for clone 27706.

SEQ ID NO: 473 is the determined cDNA sequence for clone 27707.

SEQ ID NO: 474 is the determined cDNA sequence for clone 27708.

SEQ ID NO: 475 is the determined cDNA sequence for clone 27709.

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SEQ ID NO: 477 is the determined cDNA sequence for clone 27711.

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SEQ ID NO: 494 is the determined cDNA sequence for clone 25018

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SEQ ID NO: 505 is the determined cDNA sequence for clone 25043.

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SEQ ID NO: 507 is the determined cDNA sequence for clone 25045.

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SEQ ID NO: 555 is the determined cDNA sequence for clone 26197.

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SEQ ID NO: 561 is the determined cDNA sequence for clone 26205.

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SEQ ID NO: 565 is the determined cDNA sequence for clone 26212.

SEQ ID NO: 566 is the determined cDNA sequence for clone 26213.

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SEQ ID NO: 568 is the determined cDNA sequence for clone 26215.

SEQ ID NO: 569 is the determined cDNA sequence for clone 26216.

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SEQ ID NO: 574 is the determined cDNA sequence for clone 26221.

SEQ ID NO: 575 is the determined cDNA sequence for clone 26224.

SEQ ID NO: 576 is the determined cDNA sequence for clone 26225.

SEQ ID NO: 577 is the determined cDNA sequence for clone 26226.

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SEQ ID NO: 579 is the determined cDNA sequence for clone 26228.

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SEQ ID NO: 610 is the determined cDNA sequence for clone 26269.
SEQ ID NO: 611 is the determined cDNA sequence for clone 26271.
SEQ ID NO: 612 is the determined cDNA sequence for clone 26273.
SEQ ID NO: 613 is the determined cDNA sequence for clone 26810.
SEQ ID NO: 614 is the determined cDNA sequence for clone 26811.
SEQ ID NO: 615 is the determined cDNA sequence for clone 26812.1.
SEQ ID NO: 616 is the determined cDNA sequence for clone 26812.2.
SEQ ID NO: 617 is the determined cDNA sequence for clone 26813.

SEQ ID NO: 618 is the determined cDNA sequence for clone 26814.

SEQ ID NO: 619 is the determined cDNA sequence for clone 26815.

SEQ ID NO: 620 is the determined cDNA sequence for clone 26816.

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SEQ ID NO: 625 is the determined cDNA sequence for clone 26822.

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SEQ ID NO: 631 is the determined cDNA sequence for clone 26830.

SEQ ID NO: 632 is the determined cDNA sequence for clone 26831.

SEQ ID NO: 633 is the determined cDNA sequence for clone 26832.

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SEQ ID NO: 645 is the determined cDNA sequence for clone 26849.

SEQ ID NO: 646 is the determined cDNA sequence for clone 26850.

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SEQ ID NO: 648 is the determined cDNA sequence for clone 26852.

SEQ ID NO: 649 is the determined cDNA sequence for clone 26853.
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SEQ ID NO: 654 is the determined cDNA sequence for clone 26859.
SEQ ID NO: 655 is the determined cDNA sequence for clone 26860.
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SEQ ID NO: 664 is the determined cDNA sequence for clone 26875.
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SEQ ID NO: 666 is the determined cDNA sequence for clone 26877.
SEQ ID NO: 667 is the determined cDNA sequence for clone 26878.
SEQ ID NO: 668 is the determined cDNA sequence for clone 26880.
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SEQ ID NO: 670 is the determined cDNA sequence for clone 26883.
SEQ ID NO: 671 is the determined cDNA sequence for clone 26884.
SEQ ID NO: 672 is the determined cDNA sequence for clone 26885.
SEQ ID NO: 673 is the determined cDNA sequence for clone 26886.
SEQ ID NO: 674 is the determined cDNA sequence for clone 26887.
SEQ ID NO: 675 is the determined cDNA sequence for clone 26888.
SEQ ID NO: 676 is the determined cDNA sequence for clone 26889.
SEQ ID NO: 677 is the determined cDNA sequence for clone 26890.
SEQ ID NO: 678 is the determined cDNA sequence for clone 26892.
SEQ ID NO: 679 is the determined cDNA sequence for clone 26894.

SEQ ID NO: 680 is the determined cDNA sequence for clone 26895.

SEQ ID NO: 681 is the determined cDNA sequence for clone 26897.

SEQ ID NO: 682 is the determined cDNA sequence for clone 26898.

SEQ ID NO: 683 is the determined cDNA sequence for clone 26899.

SEQ ID NO: 684 is the determined cDNA sequence for clone 26900.

SEQ ID NO: 685 is the determined cDNA sequence for clone 26901.

SEQ ID NO: 686 is the determined cDNA sequence for clone 26903.

SEQ ID NO: 687 is the determined cDNA sequence for clone 26905.

SEQ ID NO: 688 is the determined cDNA sequence for clone 26906.

SEQ ID NO: 689 is the determined cDNA sequence for clone 26708.

SEQ ID NO: 690 is the determined cDNA sequence for clone 26709.

SEQ ID NO: 691 is the determined cDNA sequence for clone 26710.

SEQ ID NO: 692 is the determined cDNA sequence for clone 26711.

SEQ ID NO: 693 is the determined cDNA sequence for clone 26712.

SEQ ID NO: 694 is the determined cDNA sequence for clone 26713.

SEQ ID NO: 695 is the determined cDNA sequence for clone 26714.

SEQ ID NO: 696 is the determined cDNA sequence for clone 26715.

SEQ ID NO: 697 is the determined cDNA sequence for clone 26716.

SEQ ID NO: 698 is the determined cDNA sequence for clone 26717.

SEQ ID NO: 699 is the determined cDNA sequence for clone 26718.

SEQ ID NO: 700 is the determined cDNA sequence for clone 26719.

SEQ ID NO: 701 is the determined cDNA sequence for clone 26720.

SEQ ID NO: 702 is the determined cDNA sequence for clone 26721.

SEQ ID NO: 703 is the determined cDNA sequence for clone 26722.

SEQ ID NO: 704 is the determined cDNA sequence for clone 26723.

SEQ ID NO: 705 is the determined cDNA sequence for clone 26724.

SEQ ID NO: 706 is the determined cDNA sequence for clone 26725.

SEQ ID NO: 707 is the determined cDNA sequence for clone 26726.

SEQ ID NO: 708 is the determined cDNA sequence for clone 26727.

SEQ ID NO: 709 is the determined cDNA sequence for clone 26728.

SEQ ID NO: 710 is the determined cDNA sequence for clone 26729.

SEQ ID NO: 711 is the determined cDNA sequence for clone 26730.

SEQ ID NO: 712 is the determined cDNA sequence for clone 26731.

SEQ ID NO: 713 is the determined cDNA sequence for clone 26732.

SEQ ID NO: 714 is the determined cDNA sequence for clone 26733.1.

SEQ ID NO: 715 is the determined cDNA sequence for clone 26733.2.

SEQ ID NO: 716 is the determined cDNA sequence for clone 26734.

SEQ ID NO: 717 is the determined cDNA sequence for clone 26735.

SEQ ID NO: 718 is the determined cDNA sequence for clone 26736.

SEQ ID NO: 719 is the determined cDNA sequence for clone 26737.

SEQ ID NO: 720 is the determined cDNA sequence for clone 26738.

SEQ ID NO: 721 is the determined cDNA sequence for clone 26739.

SEQ ID NO: 722 is the determined cDNA sequence for clone 26741.

SEQ ID NO: 723 is the determined cDNA sequence for clone 26742.

SEQ ID NO: 724 is the determined cDNA sequence for clone 26743.

SEQ ID NO: 725 is the determined cDNA sequence for clone 26744.

SEQ ID NO: 726 is the determined cDNA sequence for clone 26745.

SEQ ID NO: 727 is the determined cDNA sequence for clone 26746.

SEQ ID NO: 728 is the determined cDNA sequence for clone 26747.

SEQ ID NO: 729 is the determined cDNA sequence for clone 26748.

SEQ ID NO: 730 is the determined cDNA sequence for clone 26749.

SEQ ID NO: 731 is the determined cDNA sequence for clone 26750.

SEQ ID NO: 732 is the determined cDNA sequence for clone 26751.

SEQ ID NO: 733 is the determined cDNA sequence for clone 26752.

SEQ ID NO: 734 is the determined cDNA sequence for clone 26753.

SEQ ID NO: 735 is the determined cDNA sequence for clone 26754.

SEQ ID NO: 736 is the determined cDNA sequence for clone 26755.

SEQ ID NO: 737 is the determined cDNA sequence for clone 26756.

SEQ ID NO: 738 is the determined cDNA sequence for clone 26757.

SEQ ID NO: 739 is the determined cDNA sequence for clone 26758.

SEQ ID NO: 740 is the determined cDNA sequence for clone 26759.

SEQ ID NO: 741 is the determined cDNA sequence for clone 26760.

SEQ ID NO: 742 is the determined cDNA sequence for clone 26761.

SEQ ID NO: 743 is the determined cDNA sequence for clone 26762.

SEQ ID NO: 744 is the determined cDNA sequence for clone 26763.

SEQ ID NO: 745 is the determined cDNA sequence for clone 26764.

SEQ ID NO: 746 is the determined cDNA sequence for clone 26765.

SEQ ID NO: 747 is the determined cDNA sequence for clone 26766.

SEQ ID NO: 748 is the determined cDNA sequence for clone 26767.

SEQ ID NO: 749 is the determined cDNA sequence for clone 26768.

SEQ ID NO: 750 is the determined cDNA sequence for clone 26769.

SEQ ID NO: 751 is the determined cDNA sequence for clone 26770.

SEQ ID NO: 752 is the determined cDNA sequence for clone 26771.

SEQ ID NO: 753 is the determined cDNA sequence for clone 26772.

SEQ ID NO: 754 is the determined cDNA sequence for clone 26773.

SEQ ID NO: 755 is the determined cDNA sequence for clone 26774.

SEQ ID NO: 756 is the determined cDNA sequence for clone 26775.

SEQ ID NO: 757 is the determined cDNA sequence for clone 26776.

SEQ ID NO: 758 is the determined cDNA sequence for clone 26777.

SEQ ID NO: 759 is the determined cDNA sequence for clone 26778.

SEQ ID NO: 760 is the determined cDNA sequence for clone 26779.

SEQ ID NO: 761 is the determined cDNA sequence for clone 26781.

SEQ ID NO: 762 is the determined cDNA sequence for clone 26782.

SEQ ID NO: 763 is the determined cDNA sequence for clone 26783.

SEQ ID NO: 764 is the determined cDNA sequence for clone 26784.

SEQ ID NO: 765 is the determined cDNA sequence for clone 26785.

SEQ ID NO: 766 is the determined cDNA sequence for clone 26786.

SEQ ID NO: 767 is the determined cDNA sequence for clone 26787.

SEQ ID NO: 768 is the determined cDNA sequence for clone 26788.

SEQ ID NO: 769 is the determined cDNA sequence for clone 26790.

SEQ ID NO: 770 is the determined cDNA sequence for clone 26791.

SEQ ID NO: 771 is the determined cDNA sequence for clone 26792.

SEQ ID NO: 772 is the determined cDNA sequence for clone 26793.

SEQ ID NO: 773 is the determined cDNA sequence for clone 26794.

SEQ ID NO: 774 is the determined cDNA sequence for clone 26795.

SEQ ID NO: 775 is the determined cDNA sequence for clone 26796.

SEQ ID NO: 776 is the determined cDNA sequence for clone 26797.

SEQ ID NO: 777 is the determined cDNA sequence for clone 26798.

SEQ ID NO: 778 is the determined cDNA sequence for clone 26800.

SEQ ID NO: 779 is the determined cDNA sequence for clone 26801.

SEQ ID NO: 780 is the determined cDNA sequence for clone 26802.

SEQ ID NO: 781 is the determined cDNA sequence for clone 26803.

SEQ ID NO: 782 is the determined cDNA sequence for clone 26804.

SEQ ID NO: 783 is the amino acid sequence for L773P.

SEQ ID NO: 784 is the determined DNA sequence of the L773P expression construct.

SEQ ID NO: 785 is the determined DNA sequence of the L773PA expression construct.

SEQ ID NO: 786 is a predicted amino acid sequence for L552S.

SEQ ID NO: 787 is a predicted amino acid sequence for L840P.

SEQ ID NO: 788 is the full-length cDNA sequence for L548S.

SEQ ID NO: 789 is the amino acid sequence encoded by SEQ ID NO: 788.

SEQ ID NO: 790 is an extended cDNA sequence for L552S.

SEQ ID NO: 791 is the predicted amino acid sequence encoded by the cDNA sequence of SEQ ID NO: 790.

SEQ ID NO: 792 is the determined cDNA sequence for an isoform of L552S.

SEQ ID NO: 793 is the predicted amino acid sequence encoded by SEQ ID NO: 792.

SEQ ID NO: 794 is an extended cDNA sequence for L840P.

SEQ ID NO: 795 is the predicted amino acid sequence encoded by SEQ DI NO: 794.

SEQ ID NO: 796 is an extended cDNA sequence for L801P.

SEQ ID NO: 797 is a first predicted amino acid sequence encoded by SEQ ID NO: 796.

SEQ ID NO: 798 is a second predicted amino acid sequence encoded by SEQ ID NO: 796.

SEQ ID NO: 799 is a third predicted amino acid sequence encoded by SEQ ID NO: 796.

SEQ ID NO: 800 is the determined full-length sequence for L844P.

SEQ ID NO: 801 is the 5' consensus cDNA sequence for L551S.

SEQ ID NO: 802 is the 3' consensus cDNA sequence for L551S.

SEQ ID NO: 803 is the cDNA sequence for STY8.

SEQ ID NO: 804 is an extended cDNA sequence for L551S.

SEQ ID NO: 805 is the amino acid sequence for STY8.

SEQ ID NO: 806 is the extended amino acid sequence for L551S.

SEQ ID NO: 807 is the determined full-length cDNA sequence for L773P.

SEQ ID NO: 808 is the full-length cDNA sequence of L552S.

SEQ ID NO: 809 is the full-length amino acid sequence of L552S.

SEQ ID NO: 810 is the determined cDNA sequence of clone 50989.

SEQ ID NO: 811 is the determined cDNA sequence of clone 50990.

SEQ ID NO: 812 is the determined cDNA sequence of clone 50992.

SEQ ID NO: 813-824 are the determined cDNA sequences for clones isolated from lung tumor tissue.

SEQ ID NO: 825 is the determined cDNA sequence for the full-length L551S clone 54305.

SEQ ID NO: 826 is the determined cDNA sequence for the full-length L551S clone 54298.

SEQ ID NO: 827 is the full-length amino acid sequence for L551S.

DETAILED DESCRIPTION OF THE INVENTION

As noted above, the present invention is generally directed to compositions and methods for using the compositions, for example in the therapy and diagnosis of cancer, such as lung cancer. Certain illustrative compositions described herein include lung tumor polypeptides, polynucleotides encoding such polypeptides, binding agents such as antibodies, antigen presenting cells (APCs) and/or immune system cells (*e.g.*, T cells). A " lung tumor protein," as the term is used herein, refers generally to a protein that is expressed in lung tumor cells at a level that is at least two fold, and preferably at least five fold, greater than the level of expression in a normal tissue, as determined using a representative assay provided herein. Certain lung tumor proteins are tumor proteins that react detectably (within an immunoassay, such as an ELISA or Western blot) with antisera of a patient afflicted with lung cancer.

Therefore, in accordance with the above, and as described further below, the present invention provides illustrative polynucleotide compositions having sequences set forth in SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826, illustrative polypeptide compositions having amino acid sequences set forth in SEQ ID NO: 786, 787, 791, 793, 795, 797-799, 806, 809 and 827, antibody compositions capable of binding such polypeptides, and numerous additional embodiments employing such compositions, for example in the detection, diagnosis and/or therapy of human lung cancer.

POLYNUCLEOTIDE COMPOSITIONS

As used herein, the terms "DNA segment" and "polynucleotide" refer to a DNA molecule that has been isolated free of total genomic DNA of a particular species. Therefore, a DNA segment encoding a polypeptide refers to a DNA segment that contains one or more coding sequences yet is substantially isolated away from, or

purified free from, total genomic DNA of the species from which the DNA segment is obtained. Included within the terms "DNA segment" and "polynucleotide" are DNA segments and smaller fragments of such segments, and also recombinant vectors, including, for example, plasmids, cosmids, phagemids, phage, viruses, and the like.

As will be understood by those skilled in the art, the DNA segments of this invention can include genomic sequences, extra-genomic and plasmid-encoded sequences and smaller engineered gene segments that express, or may be adapted to express, proteins, polypeptides, peptides and the like. Such segments may be naturally isolated, or modified synthetically by the hand of man.

"Isolated," as used herein, means that a polynucleotide is substantially away from other coding sequences, and that the DNA segment does not contain large portions of unrelated coding DNA, such as large chromosomal fragments or other functional genes or polypeptide coding regions. Of course, this refers to the DNA segment as originally isolated, and does not exclude genes or coding regions later added to the segment by the hand of man.

As will be recognized by the skilled artisan, polynucleotides may be single-stranded (coding or antisense) or double-stranded, and may be DNA (genomic, cDNA or synthetic) or RNA molecules. RNA molecules include HnRNA molecules, which contain introns and correspond to a DNA molecule in a one-to-one manner, and mRNA molecules, which do not contain introns. Additional coding or non-coding sequences may, but need not, be present within a polynucleotide of the present invention, and a polynucleotide may, but need not, be linked to other molecules and/or support materials.

Polynucleotides may comprise a native sequence (*i.e.*, an endogenous sequence that encodes a lung tumor protein or a portion thereof) or may comprise a variant, or a biological or antigenic functional equivalent of such a sequence. Polynucleotide variants may contain one or more substitutions, additions, deletions and/or insertions, as further described below, preferably such that the immunogenicity of the encoded polypeptide is not diminished, relative to a native tumor protein. The effect on the immunogenicity of the encoded polypeptide may generally be assessed as

described herein. The term "variants" also encompasses homologous genes of xenogenic origin.

When comparing polynucleotide or polypeptide sequences, two sequences are said to be "identical" if the sequence of nucleotides or amino acids in the two sequences is the same when aligned for maximum correspondence, as described below. Comparisons between two sequences are typically performed by comparing the sequences over a comparison window to identify and compare local regions of sequence similarity. A "comparison window" as used herein, refers to a segment of at least about 20 contiguous positions, usually 30 to about 75, 40 to about 50, in which a sequence may be compared to a reference sequence of the same number of contiguous positions after the two sequences are optimally aligned.

Optimal alignment of sequences for comparison may be conducted using the Megalign program in the Lasergene suite of bioinformatics software (DNASTAR, Inc., Madison, WI), using default parameters. This program embodies several alignment schemes described in the following references: Dayhoff, M.O. (1978) A model of evolutionary change in proteins – Matrices for detecting distant relationships. In Dayhoff, M.O. (ed.) Atlas of Protein Sequence and Structure, National Biomedical Research Foundation, Washington DC Vol. 5, Suppl. 3, pp. 345-358; Hein J. (1990) Unified Approach to Alignment and Phylogenes pp. 626-645 *Methods in Enzymology* vol. 183, Academic Press, Inc., San Diego, CA; Higgins, D.G. and Sharp, P.M. (1989) *CABIOS 5*:151-153; Myers, E.W. and Muller W. (1988) *CABIOS 4*:11-17; Robinson, E.D. (1971) *Comb. Theor 11*:105; Santou, N. Nes, M. (1987) *Mol. Biol. Evol. 4*:406-425; Sneath, P.H.A. and Sokal, R.R. (1973) *Numerical Taxonomy – the Principles and Practice of Numerical Taxonomy*, Freeman Press, San Francisco, CA; Wilbur, W.J. and Lipman, D.J. (1983) *Proc. Natl. Acad., Sci. USA 80*:726-730.

Alternatively, optimal alignment of sequences for comparison may be conducted by the local identity algorithm of Smith and Waterman (1981) *Add. APL. Math* 2:482, by the identity alignment algorithm of Needleman and Wunsch (1970) *J. Mol. Biol.* 48:443, by the search for similarity methods of Pearson and Lipman (1988) *Proc. Natl. Acad. Sci. USA* 85: 2444, by computerized implementations of these algorithms (GAP, BESTFIT, BLAST, FASTA, and TFASTA in the Wisconsin Genetics

Software Package, Genetics Computer Group (GCG), 575 Science Dr., Madison, WI), or by inspection.

One preferred example of algorithms that are suitable for determining percent sequence identity and sequence similarity are the BLAST and BLAST 2.0 algorithms, which are described in Altschul *et al.* (1977) *Nucl. Acids Res.* 25:3389-3402 and Altschul *et al.* (1990) *J. Mol. Biol.* 215:403-410, respectively. BLAST and BLAST 2.0 can be used, for example with the parameters described herein, to determine percent sequence identity for the polynucleotides and polypeptides of the invention. Software for performing BLAST analyses is publicly available through the National Center for Biotechnology Information. In one illustrative example, cumulative scores can be calculated using, for nucleotide sequences, the parameters M (reward score for a pair of matching residues; always >0) and N (penalty score for mismatching residues; always <0). For amino acid sequences, a scoring matrix can be used to calculate the cumulative score. Extension of the word hits in each direction are halted when: the cumulative alignment score falls off by the quantity X from its maximum achieved value; the cumulative score goes to zero or below, due to the accumulation of one or more negative-scoring residue alignments; or the end of either sequence is reached. The BLAST algorithm parameters W, T and X determine the sensitivity and speed of the alignment. The BLASTN program (for nucleotide sequences) uses as defaults a wordlength (W) of 11, and expectation (E) of 10, and the BLOSUM62 scoring matrix (see Henikoff and Henikoff (1989) *Proc. Natl. Acad. Sci. USA* 89:10915) alignments, (B) of 50, expectation (E) of 10, M=5, N=-4 and a comparison of both strands.

Preferably, the "percentage of sequence identity" is determined by comparing two optimally aligned sequences over a window of comparison of at least 20 positions, wherein the portion of the polynucleotide or polypeptide sequence in the comparison window may comprise additions or deletions (*i.e.*, gaps) of 20 percent or less, usually 5 to 15 percent, or 10 to 12 percent, as compared to the reference sequences (which does not comprise additions or deletions) for optimal alignment of the two sequences. The percentage is calculated by determining the number of positions at which the identical nucleic acid bases or amino acid residue occurs in both sequences to yield the number of matched positions, dividing the number of matched positions by the

total number of positions in the reference sequence (*i.e.*, the window size) and multiplying the results by 100 to yield the percentage of sequence identity.

Therefore, the present invention encompasses polynucleotide and polypeptide sequences having substantial identity to the sequences disclosed herein, for example those comprising at least 50% sequence identity, preferably at least 55%, 60%, 65%, 70%, 75%, 80%, 85%, 90%, 95%, 96%, 97%, 98%, or 99% or higher, sequence identity compared to a polynucleotide or polypeptide sequence of this invention using the methods described herein, (*e.g.*, BLAST analysis using standard parameters, as described below). One skilled in this art will recognize that these values can be appropriately adjusted to determine corresponding identity of proteins encoded by two nucleotide sequences by taking into account codon degeneracy, amino acid similarity, reading frame positioning and the like.

In additional embodiments, the present invention provides isolated polynucleotides and polypeptides comprising various lengths of contiguous stretches of sequence identical to or complementary to one or more of the sequences disclosed herein. For example, polynucleotides are provided by this invention that comprise at least about 15, 20, 30, 40, 50, 75, 100, 150, 200, 300, 400, 500 or 1000 or more contiguous nucleotides of one or more of the sequences disclosed herein as well as all intermediate lengths there between. It will be readily understood that "intermediate lengths", in this context, means any length between the quoted values, such as 16, 17, 18, 19, *etc.*; 21, 22, 23, *etc.*; 30, 31, 32, *etc.*; 50, 51, 52, 53, *etc.*; 100, 101, 102, 103, *etc.*; 150, 151, 152, 153, *etc.*; including all integers through 200-500; 500-1,000, and the like.

The polynucleotides of the present invention, or fragments thereof, regardless of the length of the coding sequence itself, may be combined with other DNA sequences, such as promoters, polyadenylation signals, additional restriction enzyme sites, multiple cloning sites, other coding segments, and the like, such that their overall length may vary considerably. It is therefore contemplated that a nucleic acid fragment of almost any length may be employed, with the total length preferably being limited by the ease of preparation and use in the intended recombinant DNA protocol. For example, illustrative DNA segments with total lengths of about 10,000, about 5000,

about 3000, about 2,000, about 1,000, about 500, about 200, about 100, about 50 base pairs in length, and the like, (including all intermediate lengths) are contemplated to be useful in many implementations of this invention.

In other embodiments, the present invention is directed to polynucleotides that are capable of hybridizing under moderately stringent conditions to a polynucleotide sequence provided herein, or a fragment thereof, or a complementary sequence thereof. Hybridization techniques are well known in the art of molecular biology. For purposes of illustration, suitable moderately stringent conditions for testing the hybridization of a polynucleotide of this invention with other polynucleotides include prewashing in a solution of 5 X SSC, 0.5% SDS, 1.0 mM EDTA (pH 8.0); hybridizing at 50°C-65°C, 5 X SSC, overnight; followed by washing twice at 65°C for 20 minutes with each of 2X, 0.5X and 0.2X SSC containing 0.1% SDS.

Moreover, it will be appreciated by those of ordinary skill in the art that, as a result of the degeneracy of the genetic code, there are many nucleotide sequences that encode a polypeptide as described herein. Some of these polynucleotides bear minimal homology to the nucleotide sequence of any native gene. Nonetheless, polynucleotides that vary due to differences in codon usage are specifically contemplated by the present invention. Further, alleles of the genes comprising the polynucleotide sequences provided herein are within the scope of the present invention. Alleles are endogenous genes that are altered as a result of one or more mutations, such as deletions, additions and/or substitutions of nucleotides. The resulting mRNA and protein may, but need not, have an altered structure or function. Alleles may be identified using standard techniques (such as hybridization, amplification and/or database sequence comparison).

Probes and Primers

In other embodiments of the present invention, the polynucleotide sequences provided herein can be advantageously used as probes or primers for nucleic acid hybridization. As such, it is contemplated that nucleic acid segments that comprise a sequence region of at least about 15 nucleotide long contiguous sequence that has the

same sequence as, or is complementary to, a 15 nucleotide long contiguous sequence disclosed herein will find particular utility. Longer contiguous identical or complementary sequences, *e.g.*, those of about 20, 30, 40, 50, 100, 200, 500, 1000 (including all intermediate lengths) and even up to full length sequences will also be of use in certain embodiments.

The ability of such nucleic acid probes to specifically hybridize to a sequence of interest will enable them to be of use in detecting the presence of complementary sequences in a given sample. However, other uses are also envisioned, such as the use of the sequence information for the preparation of mutant species primers, or primers for use in preparing other genetic constructions.

Polynucleotide molecules having sequence regions consisting of contiguous nucleotide stretches of 10-14, 15-20, 30, 50, or even of 100-200 nucleotides or so (including intermediate lengths as well), identical or complementary to a polynucleotide sequence disclosed herein, are particularly contemplated as hybridization probes for use in, *e.g.*, Southern and Northern blotting. This would allow a gene product, or fragment thereof, to be analyzed, both in diverse cell types and also in various bacterial cells. The total size of fragment, as well as the size of the complementary stretch(es), will ultimately depend on the intended use or application of the particular nucleic acid segment. Smaller fragments will generally find use in hybridization embodiments, wherein the length of the contiguous complementary region may be varied, such as between about 15 and about 100 nucleotides, but larger contiguous complementarity stretches may be used, according to the length complementary sequences one wishes to detect.

The use of a hybridization probe of about 15-25 nucleotides in length allows the formation of a duplex molecule that is both stable and selective. Molecules having contiguous complementary sequences over stretches greater than 15 bases in length are generally preferred, though, in order to increase stability and selectivity of the hybrid, and thereby improve the quality and degree of specific hybrid molecules obtained. One will generally prefer to design nucleic acid molecules having gene-complementary stretches of 15 to 25 contiguous nucleotides, or even longer where desired.

Hybridization probes may be selected from any portion of any of the sequences disclosed herein. All that is required is to review the sequence set forth in SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826, or to any continuous portion of the sequence, from about 15-25 nucleotides in length up to and including the full length sequence, that one wishes to utilize as a probe or primer. The choice of probe and primer sequences may be governed by various factors. For example, one may wish to employ primers from towards the termini of the total sequence.

Small polynucleotide segments or fragments may be readily prepared by, for example, directly synthesizing the fragment by chemical means, as is commonly practiced using an automated oligonucleotide synthesizer. Also, fragments may be obtained by application of nucleic acid reproduction technology, such as the PCR™ technology of U. S. Patent 4,683,202 (incorporated herein by reference), by introducing selected sequences into recombinant vectors for recombinant production, and by other recombinant DNA techniques generally known to those of skill in the art of molecular biology.

The nucleotide sequences of the invention may be used for their ability to selectively form duplex molecules with complementary stretches of the entire gene or gene fragments of interest. Depending on the application envisioned, one will typically desire to employ varying conditions of hybridization to achieve varying degrees of selectivity of probe towards target sequence. For applications requiring high selectivity, one will typically desire to employ relatively stringent conditions to form the hybrids, *e.g.*, one will select relatively low salt and/or high temperature conditions, such as provided by a salt concentration of from about 0.02 M to about 0.15 M salt at temperatures of from about 50°C to about 70°C. Such selective conditions tolerate

little, if any, mismatch between the probe and the template or target strand, and would be particularly suitable for isolating related sequences.

Of course, for some applications, for example, where one desires to prepare mutants employing a mutant primer strand hybridized to an underlying template, less stringent (reduced stringency) hybridization conditions will typically be needed in order to allow formation of the heteroduplex. In these circumstances, one may desire to employ salt conditions such as those of from about 0.15 M to about 0.9 M salt, at temperatures ranging from about 20°C to about 55°C. Cross-hybridizing species can thereby be readily identified as positively hybridizing signals with respect to control hybridizations. In any case, it is generally appreciated that conditions can be rendered more stringent by the addition of increasing amounts of formamide, which serves to destabilize the hybrid duplex in the same manner as increased temperature. Thus, hybridization conditions can be readily manipulated, and thus will generally be a method of choice depending on the desired results.

POLYNUCLEOTIDE IDENTIFICATION AND CHARACTERIZATION

Polynucleotides may be identified, prepared and/or manipulated using any of a variety of well established techniques. For example, a polynucleotide may be identified, as described in more detail below, by screening a microarray of cDNAs for tumor-associated expression (*i.e.*, expression that is at least two fold greater in a tumor than in normal tissue, as determined using a representative assay provided herein). Such screens may be performed, for example, using a Synteni microarray (Palo Alto, CA) according to the manufacturer's instructions (and essentially as described by Schena *et al.*, *Proc. Natl. Acad. Sci. USA 93*:10614-10619, 1996 and Heller *et al.*, *Proc. Natl. Acad. Sci. USA 94*:2150-2155, 1997). Alternatively, polynucleotides may be amplified from cDNA prepared from cells expressing the proteins described herein, such as lung tumor cells. Such polynucleotides may be amplified via polymerase chain reaction (PCR). For this approach, sequence-specific primers may be designed based on the sequences provided herein, and may be purchased or synthesized.

An amplified portion of a polynucleotide of the present invention may be used to isolate a full length gene from a suitable library (*e.g.*, a lung tumor cDNA

library) using well known techniques. Within such techniques, a library (cDNA or genomic) is screened using one or more polynucleotide probes or primers suitable for amplification. Preferably, a library is size-selected to include larger molecules. Random primed libraries may also be preferred for identifying 5' and upstream regions of genes. Genomic libraries are preferred for obtaining introns and extending 5' sequences.

For hybridization techniques, a partial sequence may be labeled (*e.g.*, by nick-translation or end-labeling with ^{32}P) using well known techniques. A bacterial or bacteriophage library is then generally screened by hybridizing filters containing denatured bacterial colonies (or lawns containing phage plaques) with the labeled probe (*see* Sambrook *et al.*, *Molecular Cloning: A Laboratory Manual,* Cold Spring Harbor Laboratories, Cold Spring Harbor, NY, 1989). Hybridizing colonies or plaques are selected and expanded, and the DNA is isolated for further analysis. cDNA clones may be analyzed to determine the amount of additional sequence by, for example, PCR using a primer from the partial sequence and a primer from the vector. Restriction maps and partial sequences may be generated to identify one or more overlapping clones. The complete sequence may then be determined using standard techniques, which may involve generating a series of deletion clones. The resulting overlapping sequences can then assembled into a single contiguous sequence. A full length cDNA molecule can be generated by ligating suitable fragments, using well known techniques.

Alternatively, there are numerous amplification techniques for obtaining a full length coding sequence from a partial cDNA sequence. Within such techniques, amplification is generally performed via PCR. Any of a variety of commercially available kits may be used to perform the amplification step. Primers may be designed using, for example, software well known in the art. Primers are preferably 22-30 nucleotides in length, have a GC content of at least 50% and anneal to the target sequence at temperatures of about 68°C to 72°C. The amplified region may be sequenced as described above, and overlapping sequences assembled into a contiguous sequence.

One such amplification technique is inverse PCR (*see* Triglia *et al.*, *Nucl. Acids Res. 16*:8186, 1988), which uses restriction enzymes to generate a fragment

in the known region of the gene. The fragment is then circularized by intramolecular ligation and used as a template for PCR with divergent primers derived from the known region. Within an alternative approach, sequences adjacent to a partial sequence may be retrieved by amplification with a primer to a linker sequence and a primer specific to a known region. The amplified sequences are typically subjected to a second round of amplification with the same linker primer and a second primer specific to the known region. A variation on this procedure, which employs two primers that initiate extension in opposite directions from the known sequence, is described in WO 96/38591. Another such technique is known as "rapid amplification of cDNA ends" or RACE. This technique involves the use of an internal primer and an external primer, which hybridizes to a polyA region or vector sequence, to identify sequences that are 5' and 3' of a known sequence. Additional techniques include capture PCR (Lagerstrom *et al.*, *PCR Methods Applic.* *1*:111-19, 1991) and walking PCR (Parker *et al.*, *Nucl. Acids. Res.* *19*:3055-60, 1991). Other methods employing amplification may also be employed to obtain a full length cDNA sequence.

In certain instances, it is possible to obtain a full length cDNA sequence by analysis of sequences provided in an expressed sequence tag (EST) database, such as that available from GenBank. Searches for overlapping ESTs may generally be performed using well known programs (*e.g.*, NCBI BLAST searches), and such ESTs may be used to generate a contiguous full length sequence. Full length DNA sequences may also be obtained by analysis of genomic fragments.

Polynucleotide Expression in Host Cells

In other embodiments of the invention, polynucleotide sequences or fragments thereof which encode polypeptides of the invention, or fusion proteins or functional equivalents thereof, may be used in recombinant DNA molecules to direct expression of a polypeptide in appropriate host cells. Due to the inherent degeneracy of the genetic code, other DNA sequences that encode substantially the same or a functionally equivalent amino acid sequence may be produced and these sequences may be used to clone and express a given polypeptide.

As will be understood by those of skill in the art, it may be advantageous in some instances to produce polypeptide-encoding nucleotide sequences possessing non-naturally occurring codons. For example, codons preferred by a particular prokaryotic or eukaryotic host can be selected to increase the rate of protein expression or to produce a recombinant RNA transcript having desirable properties, such as a half-life which is longer than that of a transcript generated from the naturally occurring sequence.

Moreover, the polynucleotide sequences of the present invention can be engineered using methods generally known in the art in order to alter polypeptide encoding sequences for a variety of reasons, including but not limited to, alterations which modify the cloning, processing, and/or expression of the gene product. For example, DNA shuffling by random fragmentation and PCR reassembly of gene fragments and synthetic oligonucleotides may be used to engineer the nucleotide sequences. In addition, site-directed mutagenesis may be used to insert new restriction sites, alter glycosylation patterns, change codon preference, produce splice variants, or introduce mutations, and so forth.

In another embodiment of the invention, natural, modified, or recombinant nucleic acid sequences may be ligated to a heterologous sequence to encode a fusion protein. For example, to screen peptide libraries for inhibitors of polypeptide activity, it may be useful to encode a chimeric protein that can be recognized by a commercially available antibody. A fusion protein may also be engineered to contain a cleavage site located between the polypeptide-encoding sequence and the heterologous protein sequence, so that the polypeptide may be cleaved and purified away from the heterologous moiety.

Sequences encoding a desired polypeptide may be synthesized, in whole or in part, using chemical methods well known in the art (see Caruthers, M. H. *et al.* (1980) *Nucl. Acids Res. Symp. Ser.* 215-223, Horn, T. *et al.* (1980) *Nucl. Acids Res. Symp. Ser.* 225-232). Alternatively, the protein itself may be produced using chemical methods to synthesize the amino acid sequence of a polypeptide, or a portion thereof. For example, peptide synthesis can be performed using various solid-phase techniques (Roberge, J. Y. *et al.* (1995) *Science 269*:202-204) and automated synthesis may be

achieved, for example, using the ABI 431A Peptide Synthesizer (Perkin Elmer, Palo Alto, CA).

A newly synthesized peptide may be substantially purified by preparative high performance liquid chromatography (*e.g.*, Creighton, T. (1983) Proteins, Structures and Molecular Principles, WH Freeman and Co., New York, N.Y.) or other comparable techniques available in the art. The composition of the synthetic peptides may be confirmed by amino acid analysis or sequencing (*e.g.*, the Edman degradation procedure). Additionally, the amino acid sequence of a polypeptide, or any part thereof, may be altered during direct synthesis and/or combined using chemical methods with sequences from other proteins, or any part thereof, to produce a variant polypeptide.

In order to express a desired polypeptide, the nucleotide sequences encoding the polypeptide, or functional equivalents, may be inserted into appropriate expression vector, *i.e.*, a vector which contains the necessary elements for the transcription and translation of the inserted coding sequence. Methods which are well known to those skilled in the art may be used to construct expression vectors containing sequences encoding a polypeptide of interest and appropriate transcriptional and translational control elements. These methods include in vitro recombinant DNA techniques, synthetic techniques, and in vivo genetic recombination. Such techniques are described in Sambrook, J. *et al.* (1989) Molecular Cloning, A Laboratory Manual, Cold Spring Harbor Press, Plainview, N.Y., and Ausubel, F. M. *et al.* (1989) Current Protocols in Molecular Biology, John Wiley & Sons, New York. N.Y.

A variety of expression vector/host systems may be utilized to contain and express polynucleotide sequences. These include, but are not limited to, microorganisms such as bacteria transformed with recombinant bacteriophage, plasmid, or cosmid DNA expression vectors; yeast transformed with yeast expression vectors; insect cell systems infected with virus expression vectors (*e.g.*, baculovirus); plant cell systems transformed with virus expression vectors (*e.g.*, cauliflower mosaic virus, CaMV; tobacco mosaic virus, TMV) or with bacterial expression vectors (*e.g.*, Ti or pBR322 plasmids); or animal cell systems.

The "control elements" or "regulatory sequences" present in an expression vector are those non-translated regions of the vector--enhancers, promoters, 5' and 3' untranslated regions--which interact with host cellular proteins to carry out transcription and translation. Such elements may vary in their strength and specificity. Depending on the vector system and host utilized, any number of suitable transcription and translation elements, including constitutive and inducible promoters, may be used. For example, when cloning in bacterial systems, inducible promoters such as the hybrid lacZ promoter of the PBLUESCRIPT phagemid (Stratagene, La Jolla, Calif.) or PSPORT1 plasmid (Gibco BRL, Gaithersburg, MD) and the like may be used. In mammalian cell systems, promoters from mammalian genes or from mammalian viruses are generally preferred. If it is necessary to generate a cell line that contains multiple copies of the sequence encoding a polypeptide, vectors based on SV40 or EBV may be advantageously used with an appropriate selectable marker.

In bacterial systems, a number of expression vectors may be selected depending upon the use intended for the expressed polypeptide. For example, when large quantities are needed, for example for the induction of antibodies, vectors which direct high level expression of fusion proteins that are readily purified may be used. Such vectors include, but are not limited to, the multifunctional *E. coli* cloning and expression vectors such as BLUESCRIPT (Stratagene), in which the sequence encoding the polypeptide of interest may be ligated into the vector in frame with sequences for the amino-terminal Met and the subsequent 7 residues of .beta.-galactosidase so that a hybrid protein is produced; pIN vectors (Van Heeke, G. and S. M. Schuster (1989) *J. Biol. Chem. 264*:5503-5509); and the like. pGEX Vectors (Promega, Madison, Wis.) may also be used to express foreign polypeptides as fusion proteins with glutathione S-transferase (GST). In general, such fusion proteins are soluble and can easily be purified from lysed cells by adsorption to glutathione-agarose beads followed by elution in the presence of free glutathione. Proteins made in such systems may be designed to include heparin, thrombin, or factor XA protease cleavage sites so that the cloned polypeptide of interest can be released from the GST moiety at will.

In the yeast, Saccharomyces cerevisiae, a number of vectors containing constitutive or inducible promoters such as alpha factor, alcohol oxidase, and PGH may

be used. For reviews, see Ausubel *et al.* (supra) and Grant *et al.* (1987) *Methods Enzymol.* 153:516-544.

In cases where plant expression vectors are used, the expression of sequences encoding polypeptides may be driven by any of a number of promoters. For example, viral promoters such as the 35S and 19S promoters of CaMV may be used alone or in combination with the omega leader sequence from TMV (Takamatsu, N. (1987) *EMBO J. 6*:307-311. Alternatively, plant promoters such as the small subunit of RUBISCO or heat shock promoters may be used (Coruzzi, G. *et al.* (1984) *EMBO J. 3*:1671-1680; Broglie, R. *et al.* (1984) *Science 224*:838-843; and Winter, J. *et al.* (1991) *Results Probl. Cell Differ. 17*:85-105). These constructs can be introduced into plant cells by direct DNA transformation or pathogen-mediated transfection. Such techniques are described in a number of generally available reviews (see, for example, Hobbs, S. or Murry, L. E. in McGraw Hill Yearbook of Science and Technology (1992) McGraw Hill, New York, N.Y.; pp. 191-196).

An insect system may also be used to express a polypeptide of interest. For example, in one such system, Autographa californica nuclear polyhedrosis virus (AcNPV) is used as a vector to express foreign genes in Spodoptera frugiperda cells or in Trichoplusia larvae. The sequences encoding the polypeptide may be cloned into a non-essential region of the virus, such as the polyhedrin gene, and placed under control of the polyhedrin promoter. Successful insertion of the polypeptide-encoding sequence will render the polyhedrin gene inactive and produce recombinant virus lacking coat protein. The recombinant viruses may then be used to infect, for example, S. frugiperda cells or Trichoplusia larvae in which the polypeptide of interest may be expressed (Engelhard, E. K. *et al.* (1994) *Proc. Natl. Acad. Sci. 91* :3224-3227).

In mammalian host cells, a number of viral-based expression systems are generally available. For example, in cases where an adenovirus is used as an expression vector, sequences encoding a polypeptide of interest may be ligated into an adenovirus transcription/translation complex consisting of the late promoter and tripartite leader sequence. Insertion in a non-essential E1 or E3 region of the viral genome may be used to obtain a viable virus which is capable of expressing the polypeptide in infected host cells (Logan, J. and Shenk, T. (1984) *Proc. Natl. Acad. Sci. 81*:3655-3659). In addition,

transcription enhancers, such as the Rous sarcoma virus (RSV) enhancer, may be used to increase expression in mammalian host cells.

Specific initiation signals may also be used to achieve more efficient translation of sequences encoding a polypeptide of interest. Such signals include the ATG initiation codon and adjacent sequences. In cases where sequences encoding the polypeptide, its initiation codon, and upstream sequences are inserted into the appropriate expression vector, no additional transcriptional or translational control signals may be needed. However, in cases where only coding sequence, or a portion thereof, is inserted, exogenous translational control signals including the ATG initiation codon should be provided. Furthermore, the initiation codon should be in the correct reading frame to ensure translation of the entire insert. Exogenous translational elements and initiation codons may be of various origins, both natural and synthetic. The efficiency of expression may be enhanced by the inclusion of enhancers which are appropriate for the particular cell system which is used, such as those described in the literature (Scharf, D. *et al.* (1994) *Results Probl. Cell Differ.* *20*:125-162).

In addition, a host cell strain may be chosen for its ability to modulate the expression of the inserted sequences or to process the expressed protein in the desired fashion. Such modifications of the polypeptide include, but are not limited to, acetylation, carboxylation. glycosylation, phosphorylation, lipidation, and acylation. Post-translational processing which cleaves a "prepro" form of the protein may also be used to facilitate correct insertion, folding and/or function. Different host cells such as CHO, HeLa, MDCK, HEK293, and WI38, which have specific cellular machinery and characteristic mechanisms for such post-translational activities, may be chosen to ensure the correct modification and processing of the foreign protein.

For long-term, high-yield production of recombinant proteins, stable expression is generally preferred. For example, cell lines which stably express a polynucleotide of interest may be transformed using expression vectors which may contain viral origins of replication and/or endogenous expression elements and a selectable marker gene on the same or on a separate vector. Following the introduction of the vector, cells may be allowed to grow for 1-2 days in an enriched media before they are switched to selective media. The purpose of the selectable marker is to confer

resistance to selection, and its presence allows growth and recovery of cells which successfully express the introduced sequences. Resistant clones of stably transformed cells may be proliferated using tissue culture techniques appropriate to the cell type.

Any number of selection systems may be used to recover transformed cell lines. These include, but are not limited to, the herpes simplex virus thymidine kinase (Wigler, M. *et al.* (1977) *Cell 11*:223-32) and adenine phosphoribosyltransferase (Lowy, I. *et al.* (1990) *Cell 22*:817-23) genes which can be employed in tk.sup.- or aprt.sup.- cells, respectively. Also, antimetabolite, antibiotic or herbicide resistance can be used as the basis for selection; for example, dhfr which confers resistance to methotrexate (Wigler, M. *et al.* (1980) *Proc. Natl. Acad. Sci. 77*:3567-70); npt, which confers resistance to the aminoglycosides, neomycin and G-418 (Colbere-Garapin, F. et al (1981) *J. Mol. Biol. 150*:1-14); and als or pat, which confer resistance to chlorsulfuron and phosphinotricin acetyltransferase, respectively (Murry, *supra*). Additional selectable genes have been described, for example, trpB, which allows cells to utilize indole in place of tryptophan, or hisD, which allows cells to utilize histinol in place of histidine (Hartman, S. C. and R. C. Mulligan (1988) *Proc. Natl. Acad. Sci. 85*:8047-51). Recently, the use of visible markers has gained popularity with such markers as anthocyanins, beta-glucuronidase and its substrate GUS, and luciferase and its substrate luciferin, being widely used not only to identify transformants, but also to quantify the amount of transient or stable protein expression attributable to a specific vector system (Rhodes, C. A. *et al.* (1995) *Methods Mol. Biol. 55*:121-131).

Although the presence/absence of marker gene expression suggests that the gene of interest is also present, its presence and expression may need to be confirmed. For example, if the sequence encoding a polypeptide is inserted within a marker gene sequence, recombinant cells containing sequences can be identified by the absence of marker gene function. Alternatively, a marker gene can be placed in tandem with a polypeptide-encoding sequence under the control of a single promoter. Expression of the marker gene in response to induction or selection usually indicates expression of the tandem gene as well.

Alternatively, host cells which contain and express a desired polynucleotide sequence may be identified by a variety of procedures known to those of

skill in the art. These procedures include, but are not limited to, DNA-DNA or DNA-RNA hybridizations and protein bioassay or immunoassay techniques which include membrane, solution, or chip based technologies for the detection and/or quantification of nucleic acid or protein.

A variety of protocols for detecting and measuring the expression of polynucleotide-encoded products, using either polyclonal or monoclonal antibodies specific for the product are known in the art. Examples include enzyme-linked immunosorbent assay (ELISA), radioimmunoassay (RIA), and fluorescence activated cell sorting (FACS). A two-site, monoclonal-based immunoassay utilizing monoclonal antibodies reactive to two non-interfering epitopes on a given polypeptide may be preferred for some applications, but a competitive binding assay may also be employed. These and other assays are described, among other places, in Hampton, R. *et al.* (1990; Serological Methods, a Laboratory Manual, APS Press, St Paul. Minn.) and Maddox, D. E. *et al.* (1983; *J. Exp. Med. 158*:1211-1216).

A wide variety of labels and conjugation techniques are known by those skilled in the art and may be used in various nucleic acid and amino acid assays. Means for producing labeled hybridization or PCR probes for detecting sequences related to polynucleotides include oligolabeling, nick translation, end-labeling or PCR amplification using a labeled nucleotide. Alternatively, the sequences, or any portions thereof may be cloned into a vector for the production of an mRNA probe. Such vectors are known in the art, are commercially available, and may be used to synthesize RNA probes in vitro by addition of an appropriate RNA polymerase such as T7, T3, or SP6 and labeled nucleotides. These procedures may be conducted using a variety of commercially available kits. Suitable reporter molecules or labels, which may be used include radionuclides, enzymes, fluorescent, chemiluminescent, or chromogenic agents as well as substrates, cofactors, inhibitors, magnetic particles, and the like.

Host cells transformed with a polynucleotide sequence of interest may be cultured under conditions suitable for the expression and recovery of the protein from cell culture. The protein produced by a recombinant cell may be secreted or contained intracellularly depending on the sequence and/or the vector used. As will be understood by those of skill in the art, expression vectors containing polynucleotides of the

invention may be designed to contain signal sequences which direct secretion of the encoded polypeptide through a prokaryotic or eukaryotic cell membrane. Other recombinant constructions may be used to join sequences encoding a polypeptide of interest to nucleotide sequence encoding a polypeptide domain which will facilitate purification of soluble proteins. Such purification facilitating domains include, but are not limited to, metal chelating peptides such as histidine-tryptophan modules that allow purification on immobilized metals, protein A domains that allow purification on immobilized immunoglobulin, and the domain utilized in the FLAGS extension/affinity purification system (Immunex Corp., Seattle, Wash.). The inclusion of cleavable linker sequences such as those specific for Factor XA or enterokinase (Invitrogen. San Diego, Calif.) between the purification domain and the encoded polypeptide may be used to facilitate purification. One such expression vector provides for expression of a fusion protein containing a polypeptide of interest and a nucleic acid encoding 6 histidine residues preceding a thioredoxin or an enterokinase cleavage site. The histidine residues facilitate purification on IMIAC (immobilized metal ion affinity chromatography) as described in Porath, J. *et al.* (1992, *Prot. Exp. Purif.* *3*:263-281) while the enterokinase cleavage site provides a means for purifying the desired polypeptide from the fusion protein. A discussion of vectors which contain fusion proteins is provided in Kroll, D. J. *et al.* (1993; *DNA Cell Biol.* *12*:441-453).

In addition to recombinant production methods, polypeptides of the invention, and fragments thereof, may be produced by direct peptide synthesis using solid-phase techniques (Merrifield J. (1963) *J. Am. Chem. Soc.* *85*:2149-2154). Protein synthesis may be performed using manual techniques or by automation. Automated synthesis may be achieved, for example, using Applied Biosystems 431A Peptide Synthesizer (Perkin Elmer). Alternatively, various fragments may be chemically synthesized separately and combined using chemical methods to produce the full length molecule.

SITE-SPECIFIC MUTAGENESIS

Site-specific mutagenesis is a technique useful in the preparation of individual peptides, or biologically functional equivalent polypeptides, through specific

mutagenesis of the underlying polynucleotides that encode them. The technique, well-known to those of skill in the art, further provides a ready ability to prepare and test sequence variants, for example, incorporating one or more of the foregoing considerations, by introducing one or more nucleotide sequence changes into the DNA. Site-specific mutagenesis allows the production of mutants through the use of specific oligonucleotide sequences which encode the DNA sequence of the desired mutation, as well as a sufficient number of adjacent nucleotides, to provide a primer sequence of sufficient size and sequence complexity to form a stable duplex on both sides of the deletion junction being traversed. Mutations may be employed in a selected polynucleotide sequence to improve, alter, decrease, modify, or otherwise change the properties of the polynucleotide itself, and/or alter the properties, activity, composition, stability, or primary sequence of the encoded polypeptide.

In certain embodiments of the present invention, the inventors contemplate the mutagenesis of the disclosed polynucleotide sequences to alter one or more properties of the encoded polypeptide, such as the antigenicity of a polypeptide vaccine. The techniques of site-specific mutagenesis are well-known in the art, and are widely used to create variants of both polypeptides and polynucleotides. For example, site-specific mutagenesis is often used to alter a specific portion of a DNA molecule. In such embodiments, a primer comprising typically about 14 to about 25 nucleotides or so in length is employed, with about 5 to about 10 residues on both sides of the junction of the sequence being altered.

As will be appreciated by those of skill in the art, site-specific mutagenesis techniques have often employed a phage vector that exists in both a single stranded and double stranded form. Typical vectors useful in site-directed mutagenesis include vectors such as the M13 phage. These phage are readily commercially-available and their use is generally well-known to those skilled in the art. Double-stranded plasmids are also routinely employed in site directed mutagenesis that eliminates the step of transferring the gene of interest from a plasmid to a phage.

In general, site-directed mutagenesis in accordance herewith is performed by first obtaining a single-stranded vector or melting apart of two strands of a double-stranded vector that includes within its sequence a DNA sequence that

encodes the desired peptide. An oligonucleotide primer bearing the desired mutated sequence is prepared, generally synthetically. This primer is then annealed with the single-stranded vector, and subjected to DNA polymerizing enzymes such as *E. coli* polymerase I Klenow fragment, in order to complete the synthesis of the mutation-bearing strand. Thus, a heteroduplex is formed wherein one strand encodes the original non-mutated sequence and the second strand bears the desired mutation. This heteroduplex vector is then used to transform appropriate cells, such as *E. coli* cells, and clones are selected which include recombinant vectors bearing the mutated sequence arrangement.

The preparation of sequence variants of the selected peptide-encoding DNA segments using site-directed mutagenesis provides a means of producing potentially useful species and is not meant to be limiting as there are other ways in which sequence variants of peptides and the DNA sequences encoding them may be obtained. For example, recombinant vectors encoding the desired peptide sequence may be treated with mutagenic agents, such as hydroxylamine, to obtain sequence variants. Specific details regarding these methods and protocols are found in the teachings of Maloy *et al.*, 1994; Segal, 1976; Prokop and Bajpai, 1991; Kuby, 1994; and Maniatis *et al.*, 1982, each incorporated herein by reference, for that purpose.

As used herein, the term "oligonucleotide directed mutagenesis procedure" refers to template-dependent processes and vector-mediated propagation which result in an increase in the concentration of a specific nucleic acid molecule relative to its initial concentration, or in an increase in the concentration of a detectable signal, such as amplification. As used herein, the term "oligonucleotide directed mutagenesis procedure" is intended to refer to a process that involves the template-dependent extension of a primer molecule. The term template dependent process refers to nucleic acid synthesis of an RNA or a DNA molecule wherein the sequence of the newly synthesized strand of nucleic acid is dictated by the well-known rules of complementary base pairing (see, for example, Watson, 1987). Typically, vector mediated methodologies involve the introduction of the nucleic acid fragment into a DNA or RNA vector, the clonal amplification of the vector, and the recovery of

the amplified nucleic acid fragment. Examples of such methodologies are provided by U. S. Patent No. 4,237,224, specifically incorporated herein by reference in its entirety.

POLYNUCLEOTIDE AMPLIFICATION TECHNIQUES

A number of template dependent processes are available to amplify the target sequences of interest present in a sample. One of the best known amplification methods is the polymerase chain reaction (PCR™) which is described in detail in U.S. Patent Nos. 4,683,195, 4,683,202 and 4,800,159, each of which is incorporated herein by reference in its entirety. Briefly, in PCR™, two primer sequences are prepared which are complementary to regions on opposite complementary strands of the target sequence. An excess of deoxynucleoside triphosphates is added to a reaction mixture along with a DNA polymerase (*e.g.*, *Taq* polymerase). If the target sequence is present in a sample, the primers will bind to the target and the polymerase will cause the primers to be extended along the target sequence by adding on nucleotides. By raising and lowering the temperature of the reaction mixture, the extended primers will dissociate from the target to form reaction products, excess primers will bind to the target and to the reaction product and the process is repeated. Preferably reverse transcription and PCR™ amplification procedure may be performed in order to quantify the amount of mRNA amplified. Polymerase chain reaction methodologies are well known in the art.

Another method for amplification is the ligase chain reaction (referred to as LCR), disclosed in Eur. Pat. Appl. Publ. No. 320,308 (specifically incorporated herein by reference in its entirety). In LCR, two complementary probe pairs are prepared, and in the presence of the target sequence, each pair will bind to opposite complementary strands of the target such that they abut. In the presence of a ligase, the two probe pairs will link to form a single unit. By temperature cycling, as in PCR™, bound ligated units dissociate from the target and then serve as "target sequences" for ligation of excess probe pairs. U.S. Patent No. 4,883,750, incorporated herein by reference in its entirety, describes an alternative method of amplification similar to LCR for binding probe pairs to a target sequence.

Qbeta Replicase, described in PCT Intl. Pat. Appl. Publ. No. PCT/US87/00880, incorporated herein by reference in its entirety, may also be used as still another amplification method in the present invention. In this method, a replicative sequence of RNA that has a region complementary to that of a target is added to a sample in the presence of an RNA polymerase. The polymerase will copy the replicative sequence that can then be detected.

An isothermal amplification method, in which restriction endonucleases and ligases are used to achieve the amplification of target molecules that contain nucleotide 5'-[α-thio]triphosphates in one strand of a restriction site (Walker *et al.*, 1992, incorporated herein by reference in its entirety), may also be useful in the amplification of nucleic acids in the present invention.

Strand Displacement Amplification (SDA) is another method of carrying out isothermal amplification of nucleic acids which involves multiple rounds of strand displacement and synthesis, *i.e.* nick translation. A similar method, called Repair Chain Reaction (RCR) is another method of amplification which may be useful in the present invention and is involves annealing several probes throughout a region targeted for amplification, followed by a repair reaction in which only two of the four bases are present. The other two bases can be added as biotinylated derivatives for easy detection. A similar approach is used in SDA.

Sequences can also be detected using a cyclic probe reaction (CPR). In CPR, a probe having a 3' and 5' sequences of non-target DNA and an internal or "middle" sequence of the target protein specific RNA is hybridized to DNA which is present in a sample. Upon hybridization, the reaction is treated with RNaseH, and the products of the probe are identified as distinctive products by generating a signal that is released after digestion. The original template is annealed to another cycling probe and the reaction is repeated. Thus, CPR involves amplifying a signal generated by hybridization of a probe to a target gene specific expressed nucleic acid.

Still other amplification methods described in Great Britain Pat. Appl. No. 2 202 328, and in PCT Intl. Pat. Appl. Publ. No. PCT/US89/01025, each of which is incorporated herein by reference in its entirety, may be used in accordance with the present invention. In the former application, "modified" primers are used in a PCR-

like, template and enzyme dependent synthesis. The primers may be modified by labeling with a capture moiety (*e.g.*, biotin) and/or a detector moiety (*e.g.*, enzyme). In the latter application, an excess of labeled probes is added to a sample. In the presence of the target sequence, the probe binds and is cleaved catalytically. After cleavage, the target sequence is released intact to be bound by excess probe. Cleavage of the labeled probe signals the presence of the target sequence.

Other nucleic acid amplification procedures include transcription-based amplification systems (TAS) (Kwoh *et al.*, 1989; PCT Intl. Pat. Appl. Publ. No. WO 88/10315, incorporated herein by reference in its entirety), including nucleic acid sequence based amplification (NASBA) and 3SR. In NASBA, the nucleic acids can be prepared for amplification by standard phenol/chloroform extraction, heat denaturation of a sample, treatment with lysis buffer and minispin columns for isolation of DNA and RNA or guanidinium chloride extraction of RNA. These amplification techniques involve annealing a primer that has sequences specific to the target sequence. Following polymerization, DNA/RNA hybrids are digested with RNase H while double stranded DNA molecules are heat-denatured again. In either case the single stranded DNA is made fully double stranded by addition of second target-specific primer, followed by polymerization. The double stranded DNA molecules are then multiply transcribed by a polymerase such as T7 or SP6. In an isothermal cyclic reaction, the RNAs are reverse transcribed into DNA, and transcribed once again with a polymerase such as T7 or SP6. The resulting products, whether truncated or complete, indicate target-specific sequences.

Eur. Pat. Appl. Publ. No. 329,822, incorporated herein by reference in its entirety, disclose a nucleic acid amplification process involving cyclically synthesizing single-stranded RNA ("ssRNA"), ssDNA, and double-stranded DNA (dsDNA), which may be used in accordance with the present invention. The ssRNA is a first template for a first primer oligonucleotide, which is elongated by reverse transcriptase (RNA-dependent DNA polymerase). The RNA is then removed from resulting DNA:RNA duplex by the action of ribonuclease H (RNase H, an RNase specific for RNA in a duplex with either DNA or RNA). The resultant ssDNA is a second template for a second primer, which also includes the sequences of an RNA polymerase

promoter (exemplified by T7 RNA polymerase) 5' to its homology to its template. This primer is then extended by DNA polymerase (exemplified by the large "Klenow" fragment of *E. coli* DNA polymerase I), resulting as a double-stranded DNA ("dsDNA") molecule, having a sequence identical to that of the original RNA between the primers and having additionally, at one end, a promoter sequence. This promoter sequence can be used by the appropriate RNA polymerase to make many RNA copies of the DNA. These copies can then re-enter the cycle leading to very swift amplification. With proper choice of enzymes, this amplification can be done isothermally without addition of enzymes at each cycle. Because of the cyclical nature of this process, the starting sequence can be chosen to be in the form of either DNA or RNA.

PCT Intl. Pat. Appl. Publ. No. WO 89/06700, incorporated herein by reference in its entirety, disclose a nucleic acid sequence amplification scheme based on the hybridization of a promoter/primer sequence to a target single-stranded DNA ("ssDNA") followed by transcription of many RNA copies of the sequence. This scheme is not cyclic; *i.e.* new templates are not produced from the resultant RNA transcripts. Other amplification methods include "RACE" (Frohman, 1990), and "one-sided PCR" (Ohara, 1989) which are well-known to those of skill in the art.

Methods based on ligation of two (or more) oligonucleotides in the presence of nucleic acid having the sequence of the resulting "di-oligonucleotide", thereby amplifying the di-oligonucleotide (Wu and Dean, 1996, incorporated herein by reference in its entirety), may also be used in the amplification of DNA sequences of the present invention.

BIOLOGICAL FUNCTIONAL EQUIVALENTS

Modification and changes may be made in the structure of the polynucleotides and polypeptides of the present invention and still obtain a functional molecule that encodes a polypeptide with desirable characteristics. As mentioned above, it is often desirable to introduce one or more mutations into a specific polynucleotide sequence. In certain circumstances, the resulting encoded polypeptide

sequence is altered by this mutation, or in other cases, the sequence of the polypeptide is unchanged by one or more mutations in the encoding polynucleotide.

When it is desirable to alter the amino acid sequence of a polypeptide to create an equivalent, or even an improved, second-generation molecule, the amino acid changes may be achieved by changing one or more of the codons of the encoding DNA sequence, according to Table 1.

For example, certain amino acids may be substituted for other amino acids in a protein structure without appreciable loss of interactive binding capacity with structures such as, for example, antigen-binding regions of antibodies or binding sites on substrate molecules. Since it is the interactive capacity and nature of a protein that defines that protein's biological functional activity, certain amino acid sequence substitutions can be made in a protein sequence, and, of course, its underlying DNA coding sequence, and nevertheless obtain a protein with like properties. It is thus contemplated by the inventors that various changes may be made in the peptide sequences of the disclosed compositions, or corresponding DNA sequences which encode said peptides without appreciable loss of their biological utility or activity.

TABLE 1

Amino Acids			Codons					
Alanine	Ala	A	GCA	GCC	GCG	GCU		
Cysteine	Cys	C	UGC	UGU				
Aspartic acid	Asp	D	GAC	GAU				
Glutamic acid	Glu	E	GAA	GAG				
Phenylalanine	Phe	F	UUC	UUU				
Glycine	Gly	G	GGA	GGC	GGG	GGU		
Histidine	His	H	CAC	CAU				
Isoleucine	Ile	I	AUA	AUC	AUU			
Lysine	Lys	K	AAA	AAG				
Leucine	Leu	L	UUA	UUG	CUA	CUC	CUG	CUU
Methionine	Met	M	AUG					
Asparagine	Asn	N	AAC	AAU				
Proline	Pro	P	CCA	CCC	CCG	CCU		
Glutamine	Gln	Q	CAA	CAG				
Arginine	Arg	R	AGA	AGG	CGA	CGC	CGG	CGU
Serine	Ser	S	AGC	AGU	UCA	UCC	UCG	UCU
Threonine	Thr	T	ACA	ACC	ACG	ACU		
Valine	Val	V	GUA	GUC	GUG	GUU		
Tryptophan	Trp	W	UGG					
Tyrosine	Tyr	Y	UAC	UAU				

In making such changes, the hydropathic index of amino acids may be considered. The importance of the hydropathic amino acid index in conferring interactive biologic function on a protein is generally understood in the art (Kyte and Doolittle, 1982, incorporated herein by reference). It is accepted that the relative hydropathic character of the amino acid contributes to the secondary structure of the resultant protein, which in turn defines the interaction of the protein with other molecules, for example, enzymes, substrates, receptors, DNA, antibodies, antigens, and the like. Each amino acid has been assigned a hydropathic index on the basis of its hydrophobicity and charge characteristics (Kyte and Doolittle, 1982). These values are:

isoleucine (+4.5); valine (+4.2); leucine (+3.8); phenylalanine (+2.8); cysteine/cystine (+2.5); methionine (+1.9); alanine (+1.8); glycine (–0.4); threonine (–0.7); serine (–0.8); tryptophan (–0.9); tyrosine (–1.3); proline (–1.6); histidine (–3.2); glutamate (–3.5); glutamine (–3.5); aspartate (–3.5); asparagine (–3.5); lysine (–3.9); and arginine (–4.5).

It is known in the art that certain amino acids may be substituted by other amino acids having a similar hydropathic index or score and still result in a protein with similar biological activity, *i.e.* still obtain a biological functionally equivalent protein. In making such changes, the substitution of amino acids whose hydropathic indices are within ±2 is preferred, those within ±1 are particularly preferred, and those within ±0.5 are even more particularly preferred. It is also understood in the art that the substitution of like amino acids can be made effectively on the basis of hydrophilicity. U. S. Patent 4,554,101 (specifically incorporated herein by reference in its entirety), states that the greatest local average hydrophilicity of a protein, as governed by the hydrophilicity of its adjacent amino acids, correlates with a biological property of the protein.

As detailed in U. S. Patent 4,554,101, the following hydrophilicity values have been assigned to amino acid residues: arginine (+3.0); lysine (+3.0); aspartate (+3.0 ± 1); glutamate (+3.0 ± 1); serine (+0.3); asparagine (+0.2); glutamine (+0.2); glycine (0); threonine (–0.4); proline (–0.5 ± 1); alanine (–0.5); histidine (–0.5); cysteine (–1.0); methionine (–1.3); valine (–1.5); leucine (–1.8); isoleucine (–1.8); tyrosine (–2.3); phenylalanine (–2.5); tryptophan (–3.4). It is understood that an amino acid can be substituted for another having a similar hydrophilicity value and still obtain a biologically equivalent, and in particular, an immunologically equivalent protein. In such changes, the substitution of amino acids whose hydrophilicity values are within ±2 is preferred, those within ±1 are particularly preferred, and those within ±0.5 are even more particularly preferred.

As outlined above, amino acid substitutions are generally therefore based on the relative similarity of the amino acid side-chain substituents, for example, their hydrophobicity, hydrophilicity, charge, size, and the like. Exemplary substitutions that take various of the foregoing characteristics into consideration are well known to those

of skill in the art and include: arginine and lysine; glutamate and aspartate; serine and threonine; glutamine and asparagine; and valine, leucine and isoleucine.

In addition, any polynucleotide may be further modified to increase stability *in vivo*. Possible modifications include, but are not limited to, the addition of flanking sequences at the 5' and/or 3' ends; the use of phosphorothioate or 2' O-methyl rather than phosphodiesterase linkages in the backbone; and/or the inclusion of nontraditional bases such as inosine, queosine and wybutosine, as well as acetyl-methyl-, thio- and other modified forms of adenine, cytidine, guanine, thymine and uridine.

IN VIVO POLYNUCLEOTIDE DELIVERY TECHNIQUES

In additional embodiments, genetic constructs comprising one or more of the polynucleotides of the invention are introduced into cells *in vivo*. This may be achieved using any of a variety or well known approaches, several of which are outlined below for the purpose of illustration.

1. ADENOVIRUS

One of the preferred methods for *in vivo* delivery of one or more nucleic acid sequences involves the use of an adenovirus expression vector. "Adenovirus expression vector" is meant to include those constructs containing adenovirus sequences sufficient to (a) support packaging of the construct and (b) to express a polynucleotide that has been cloned therein in a sense or antisense orientation. Of course, in the context of an antisense construct, expression does not require that the gene product be synthesized.

The expression vector comprises a genetically engineered form of an adenovirus. Knowledge of the genetic organization of adenovirus, a 36 kb, linear, double-stranded DNA virus, allows substitution of large pieces of adenoviral DNA with foreign sequences up to 7 kb (Grunhaus and Horwitz, 1992). In contrast to retrovirus, the adenoviral infection of host cells does not result in chromosomal integration because adenoviral DNA can replicate in an episomal manner without potential genotoxicity. Also, adenoviruses are structurally stable, and no genome rearrangement

has been detected after extensive amplification. Adenovirus can infect virtually all epithelial cells regardless of their cell cycle stage. So far, adenoviral infection appears to be linked only to mild disease such as acute respiratory disease in humans.

Adenovirus is particularly suitable for use as a gene transfer vector because of its mid-sized genome, ease of manipulation, high titer, wide target cell range and high infectivity. Both ends of the viral genome contain 100-200 base pair inverted repeats (ITRs), which are *cis* elements necessary for viral DNA replication and packaging. The early (E) and late (L) regions of the genome contain different transcription units that are divided by the onset of viral DNA replication. The E1 region (E1A and E1B) encodes proteins responsible for the regulation of transcription of the viral genome and a few cellular genes. The expression of the E2 region (E2A and E2B) results in the synthesis of the proteins for viral DNA replication. These proteins are involved in DNA replication, late gene expression and host cell shut-off (Renan, 1990). The products of the late genes, including the majority of the viral capsid proteins, are expressed only after significant processing of a single primary transcript issued by the major late promoter (MLP). The MLP, (located at 16.8 m.u.) is particularly efficient during the late phase of infection, and all the mRNA's issued from this promoter possess a 5′-tripartite leader (TPL) sequence which makes them preferred mRNA's for translation.

In a current system, recombinant adenovirus is generated from homologous recombination between shuttle vector and provirus vector. Due to the possible recombination between two proviral vectors, wild-type adenovirus may be generated from this process. Therefore, it is critical to isolate a single clone of virus from an individual plaque and examine its genomic structure.

Generation and propagation of the current adenovirus vectors, which are replication deficient, depend on a unique helper cell line, designated 293, which was transformed from human embryonic kidney cells by Ad5 DNA fragments and constitutively expresses E1 proteins (Graham *et al.*, 1977). Since the E3 region is dispensable from the adenovirus genome (Jones and Shenk, 1978), the current adenovirus vectors, with the help of 293 cells, carry foreign DNA in either the E1, the D3 or both regions (Graham and Prevec, 1991). In nature, adenovirus can package

approximately 105% of the wild-type genome (Ghosh-Choudhury *et al.*, 1987), providing capacity for about 2 extra kB of DNA. Combined with the approximately 5.5 kB of DNA that is replaceable in the E1 and E3 regions, the maximum capacity of the current adenovirus vector is under 7.5 kB, or about 15% of the total length of the vector. More than 80% of the adenovirus viral genome remains in the vector backbone and is the source of vector-borne cytotoxicity. Also, the replication deficiency of the E1-deleted virus is incomplete. For example, leakage of viral gene expression has been observed with the currently available vectors at high multiplicities of infection (MOI) (Mulligan, 1993).

Helper cell lines may be derived from human cells such as human embryonic kidney cells, muscle cells, hematopoietic cells or other human embryonic mesenchymal or epithelial cells. Alternatively, the helper cells may be derived from the cells of other mammalian species that are permissive for human adenovirus. Such cells include, *e.g.*, Vero cells or other monkey embryonic mesenchymal or epithelial cells. As stated above, the currently preferred helper cell line is 293.

Recently, Racher *et al.* (1995) disclosed improved methods for culturing 293 cells and propagating adenovirus. In one format, natural cell aggregates are grown by inoculating individual cells into 1 liter siliconized spinner flasks (Techne, Cambridge, UK) containing 100-200 ml of medium. Following stirring at 40 rpm, the cell viability is estimated with trypan blue. In another format, Fibra-Cel microcarriers (Bibby Sterlin, Stone, UK) (5 g/l) is employed as follows. A cell inoculum, resuspended in 5 ml of medium, is added to the carrier (50 ml) in a 250 ml Erlenmeyer flask and left stationary, with occasional agitation, for 1 to 4 h. The medium is then replaced with 50 ml of fresh medium and shaking initiated. For virus production, cells are allowed to grow to about 80% confluence, after which time the medium is replaced (to 25% of the final volume) and adenovirus added at an MOI of 0.05. Cultures are left stationary overnight, following which the volume is increased to 100% and shaking commenced for another 72 h.

Other than the requirement that the adenovirus vector be replication defective, or at least conditionally defective, the nature of the adenovirus vector is not believed to be crucial to the successful practice of the invention. The adenovirus may

be of any of the 42 different known serotypes or subgroups A-F. Adenovirus type 5 of subgroup C is the preferred starting material in order to obtain a conditional replication-defective adenovirus vector for use in the present invention, since Adenovirus type 5 is a human adenovirus about which a great deal of biochemical and genetic information is known, and it has historically been used for most constructions employing adenovirus as a vector.

As stated above, the typical vector according to the present invention is replication defective and will not have an adenovirus E1 region. Thus, it will be most convenient to introduce the polynucleotide encoding the gene of interest at the position from which the E1-coding sequences have been removed. However, the position of insertion of the construct within the adenovirus sequences is not critical to the invention. The polynucleotide encoding the gene of interest may also be inserted in lieu of the deleted E3 region in E3 replacement vectors as described by Karlsson *et al.* (1986) or in the E4 region where a helper cell line or helper virus complements the E4 defect.

Adenovirus is easy to grow and manipulate and exhibits broad host range *in vitro* and *in vivo*. This group of viruses can be obtained in high titers, *e.g.*, 10^9-10^{11} plaque-forming units per ml, and they are highly infective. The life cycle of adenovirus does not require integration into the host cell genome. The foreign genes delivered by adenovirus vectors are episomal and, therefore, have low genotoxicity to host cells. No side effects have been reported in studies of vaccination with wild-type adenovirus (Couch *et al.*, 1963; Top *et al.*, 1971), demonstrating their safety and therapeutic potential as *in vivo* gene transfer vectors.

Adenovirus vectors have been used in eukaryotic gene expression (Levrero *et al.*, 1991; Gomez-Foix *et al.*, 1992) and vaccine development (Grunhaus and Horwitz, 1992; Graham and Prevec, 1992). Recently, animal studies suggested that recombinant adenovirus could be used for gene therapy (Stratford-Perricaudet and Perricaudet, 1991; Stratford-Perricaudet *et al.*, 1990; Rich *et al.*, 1993). Studies in administering recombinant adenovirus to different tissues include trachea instillation (Rosenfeld *et al.*, 1991; Rosenfeld *et al.*, 1992), muscle injection (Ragot *et al.*, 1993),

peripheral intravenous injections (Herz and Gerard, 1993) and stereotactic inoculation into the brain (Le Gal La Salle *et al.*, 1993).

2. RETROVIRUSES

The retroviruses are a group of single-stranded RNA viruses characterized by an ability to convert their RNA to double-stranded DNA in infected cells by a process of reverse-transcription (Coffin, 1990). The resulting DNA then stably integrates into cellular chromosomes as a provirus and directs synthesis of viral proteins. The integration results in the retention of the viral gene sequences in the recipient cell and its descendants. The retroviral genome contains three genes, gag, pol, and env that code for capsid proteins, polymerase enzyme, and envelope components, respectively. A sequence found upstream from the gag gene contains a signal for packaging of the genome into virions. Two long terminal repeat (LTR) sequences are present at the 5′ and 3′ ends of the viral genome. These contain strong promoter and enhancer sequences and are also required for integration in the host cell genome (Coffin, 1990).

In order to construct a retroviral vector, a nucleic acid encoding one or more oligonucleotide or polynucleotide sequences of interest is inserted into the viral genome in the place of certain viral sequences to produce a virus that is replication-defective. In order to produce virions, a packaging cell line containing the gag, pol, and env genes but without the LTR and packaging components is constructed (Mann *et al.*, 1983). When a recombinant plasmid containing a cDNA, together with the retroviral LTR and packaging sequences is introduced into this cell line (by calcium phosphate precipitation for example), the packaging sequence allows the RNA transcript of the recombinant plasmid to be packaged into viral particles, which are then secreted into the culture media (Nicolas and Rubenstein, 1988; Temin, 1986; Mann *et al.*, 1983). The media containing the recombinant retroviruses is then collected, optionally concentrated, and used for gene transfer. Retroviral vectors are able to infect a broad variety of cell types. However, integration and stable expression require the division of host cells (Paskind *et al.*, 1975).

A novel approach designed to allow specific targeting of retrovirus vectors was recently developed based on the chemical modification of a retrovirus by the chemical addition of lactose residues to the viral envelope. This modification could permit the specific infection of hepatocytes *via* sialoglycoprotein receptors.

A different approach to targeting of recombinant retroviruses was designed in which biotinylated antibodies against a retroviral envelope protein and against a specific cell receptor were used. The antibodies were coupled *via* the biotin components by using streptavidin (Roux *et al.*, 1989). Using antibodies against major histocompatibility complex class I and class II antigens, they demonstrated the infection of a variety of human cells that bore those surface antigens with an ecotropic virus *in vitro* (Roux *et al.*, 1989).

3. ADENO-ASSOCIATED VIRUSES

AAV (Ridgeway, 1988; Hermonat and Muzycska, 1984) is a parovirus, discovered as a contamination of adenoviral stocks. It is a ubiquitous virus (antibodies are present in 85% of the US human population) that has not been linked to any disease. It is also classified as a dependovirus, because its replications is dependent on the presence of a helper virus, such as adenovirus. Five serotypes have been isolated, of which AAV-2 is the best characterized. AAV has a single-stranded linear DNA that is encapsidated into capsid proteins VP1, VP2 and VP3 to form an icosahedral virion of 20 to 24 nm in diameter (Muzyczka and McLaughlin, 1988).

The AAV DNA is approximately 4.7 kilobases long. It contains two open reading frames and is flanked by two ITRs. There are two major genes in the AAV genome: *rep* and *cap*. The *rep* gene codes for proteins responsible for viral replications, whereas *cap* codes for capsid protein VP1-3. Each ITR forms a T-shaped hairpin structure. These terminal repeats are the only essential *cis* components of the AAV for chromosomal integration. Therefore, the AAV can be used as a vector with all viral coding sequences removed and replaced by the cassette of genes for delivery. Three viral promoters have been identified and named p5, p19, and p40, according to their map position. Transcription from p5 and p19 results in production of rep proteins,

and transcription from p40 produces the capsid proteins (Hermonat and Muzyczka, 1984).

There are several factors that prompted researchers to study the possibility of using rAAV as an expression vector One is that the requirements for delivering a gene to integrate into the host chromosome are surprisingly few. It is necessary to have the 145-bp ITRs, which are only 6% of the AAV genome. This leaves room in the vector to assemble a 4.5-kb DNA insertion. While this carrying capacity may prevent the AAV from delivering large genes, it is amply suited for delivering the antisense constructs of the present invention.

AAV is also a good choice of delivery vehicles due to its safety. There is a relatively complicated rescue mechanism: not only wild type adenovirus but also AAV genes are required to mobilize rAAV. Likewise, AAV is not pathogenic and not associated with any disease. The removal of viral coding sequences minimizes immune reactions to viral gene expression, and therefore, rAAV does not evoke an inflammatory response.

4. OTHER VIRAL VECTORS AS EXPRESSION CONSTRUCTS

Other viral vectors may be employed as expression constructs in the present invention for the delivery of oligonucleotide or polynucleotide sequences to a host cell. Vectors derived from viruses such as vaccinia virus (Ridgeway, 1988; Coupar *et al.*, 1988), lentiviruses, polio viruses and herpes viruses may be employed. They offer several attractive features for various mammalian cells (Friedmann, 1989; Ridgeway, 1988; Coupar *et al.*, 1988; Horwich *et al.*, 1990).

With the recent recognition of defective hepatitis B viruses, new insight was gained into the structure-function relationship of different viral sequences. *In vitro* studies showed that the virus could retain the ability for helper-dependent packaging and reverse transcription despite the deletion of up to 80% of its genome (Horwich *et al.*, 1990). This suggested that large portions of the genome could be replaced with foreign genetic material. The hepatotropism and persistence (integration) were particularly attractive properties for liver-directed gene transfer. Chang *et al.* (1991) introduced the chloramphenicol acetyltransferase (CAT) gene into duck hepatitis B

virus genome in the place of the polymerase, surface, and pre-surface coding sequences. It was cotransfected with wild-type virus into an avian hepatoma cell line. Culture media containing high titers of the recombinant virus were used to infect primary duckling hepatocytes. Stable CAT gene expression was detected for at least 24 days after transfection (Chang *et al.*, 1991).

5. NON-VIRAL VECTORS

In order to effect expression of the oligonucleotide or polynucleotide sequences of the present invention, the expression construct must be delivered into a cell. This delivery may be accomplished *in vitro*, as in laboratory procedures for transforming cells lines, or *in vivo* or *ex vivo*, as in the treatment of certain disease states. As described above, one preferred mechanism for delivery is *via* viral infection where the expression construct is encapsulated in an infectious viral particle.

Once the expression construct has been delivered into the cell the nucleic acid encoding the desired oligonucleotide or polynucleotide sequences may be positioned and expressed at different sites. In certain embodiments, the nucleic acid encoding the construct may be stably integrated into the genome of the cell. This integration may be in the specific location and orientation *via* homologous recombination (gene replacement) or it may be integrated in a random, non-specific location (gene augmentation). In yet further embodiments, the nucleic acid may be stably maintained in the cell as a separate, episomal segment of DNA. Such nucleic acid segments or "episomes" encode sequences sufficient to permit maintenance and replication independent of or in synchronization with the host cell cycle. How the expression construct is delivered to a cell and where in the cell the nucleic acid remains is dependent on the type of expression construct employed.

In certain embodiments of the invention, the expression construct comprising one or more oligonucleotide or polynucleotide sequences may simply consist of naked recombinant DNA or plasmids. Transfer of the construct may be performed by any of the methods mentioned above which physically or chemically permeabilize the cell membrane. This is particularly applicable for transfer *in vitro* but it may be applied to *in vivo* use as well. Dubensky *et al.* (1984) successfully injected

polyomavirus DNA in the form of calcium phosphate precipitates into liver and spleen of adult and newborn mice demonstrating active viral replication and acute infection. Benvenisty and Reshef (1986) also demonstrated that direct intraperitoneal injection of calcium phosphate-precipitated plasmids results in expression of the transfected genes. It is envisioned that DNA encoding a gene of interest may also be transferred in a similar manner *in vivo* and express the gene product.

Another embodiment of the invention for transferring a naked DNA expression construct into cells may involve particle bombardment. This method depends on the ability to accelerate DNA-coated microprojectiles to a high velocity allowing them to pierce cell membranes and enter cells without killing them (Klein *et al.*, 1987). Several devices for accelerating small particles have been developed. One such device relies on a high voltage discharge to generate an electrical current, which in turn provides the motive force (Yang *et al.*, 1990). The microprojectiles used have consisted of biologically inert substances such as tungsten or gold beads.

Selected organs including the liver, skin, and muscle tissue of rats and mice have been bombarded *in vivo* (Yang *et al.*, 1990; Zelenin *et al.*, 1991). This may require surgical exposure of the tissue or cells, to eliminate any intervening tissue between the gun and the target organ, *i.e. ex vivo* treatment. Again, DNA encoding a particular gene may be delivered *via* this method and still be incorporated by the present invention.

ANTISENSE OLIGONUCLEOTIDES

The end result of the flow of genetic information is the synthesis of protein. DNA is transcribed by polymerases into messenger RNA and translated on the ribosome to yield a folded, functional protein. Thus there are several steps along the route where protein synthesis can be inhibited. The native DNA segment coding for a polypeptide described herein, as all such mammalian DNA strands, has two strands: a sense strand and an antisense strand held together by hydrogen bonding. The messenger RNA coding for polypeptide has the same nucleotide sequence as the sense DNA strand except that the DNA thymidine is replaced by uridine. Thus, synthetic

antisense nucleotide sequences will bind to a mRNA and inhibit expression of the protein encoded by that mRNA.

The targeting of antisense oligonucleotides to mRNA is thus one mechanism to shut down protein synthesis, and, consequently, represents a powerful and targeted therapeutic approach. For example, the synthesis of polygalacturonase and the muscarine type 2 acetylcholine receptor are inhibited by antisense oligonucleotides directed to their respective mRNA sequences (U. S. Patent 5,739,119 and U. S. Patent 5,759,829, each specifically incorporated herein by reference in its entirety). Further, examples of antisense inhibition have been demonstrated with the nuclear protein cyclin, the multiple drug resistance gene (MDG1), ICAM-1, E-selectin, STK-1, striatal $GABA_A$ receptor and human EGF (Jaskulski *et al.*, 1988; Vasanthakumar and Ahmed, 1989; Peris *et al.*, 1998; U. S. Patent 5,801,154; U. S. Patent 5,789,573; U. S. Patent 5,718,709 and U. S. Patent 5,610,288, each specifically incorporated herein by reference in its entirety). Antisense constructs have also been described that inhibit and can be used to treat a variety of abnormal cellular proliferations, *e.g.* cancer (U. S. Patent 5,747,470; U. S. Patent 5,591,317 and U. S. Patent 5,783,683, each specifically incorporated herein by reference in its entirety).

Therefore, in exemplary embodiments, the invention provides oligonucleotide sequences that comprise all, or a portion of, any sequence that is capable of specifically binding to polynucleotide sequence described herein, or a complement thereof. In one embodiment, the antisense oligonucleotides comprise DNA or derivatives thereof. In another embodiment, the oligonucleotides comprise RNA or derivatives thereof. In a third embodiment, the oligonucleotides are modified DNAs comprising a phosphorothioated modified backbone. In a fourth embodiment, the oligonucleotide sequences comprise peptide nucleic acids or derivatives thereof. In each case, preferred compositions comprise a sequence region that is complementary, and more preferably substantially-complementary, and even more preferably, completely complementary to one or more portions of polynucleotides disclosed herein.

Selection of antisense compositions specific for a given gene sequence is based upon analysis of the chosen target sequence (*i.e.* in these illustrative examples the rat and human sequences) and determination of secondary structure, T_m, binding

energy, relative stability, and antisense compositions were selected based upon their relative inability to form dimers, hairpins, or other secondary structures that would reduce or prohibit specific binding to the target mRNA in a host cell.

Highly preferred target regions of the mRNA, are those which are at or near the AUG translation initiation codon, and those sequences which were substantially complementary to 5' regions of the mRNA. These secondary structure analyses and target site selection considerations were performed using v.4 of the OLIGO primer analysis software (Rychlik, 1997) and the BLASTN 2.0.5 algorithm software (Altschul *et al.*, 1997).

The use of an antisense delivery method employing a short peptide vector, termed MPG (27 residues), is also contemplated. The MPG peptide contains a hydrophobic domain derived from the fusion sequence of HIV gp41 and a hydrophilic domain from the nuclear localization sequence of SV40 T-antigen (Morris *et al.*, 1997). It has been demonstrated that several molecules of the MPG peptide coat the antisense oligonucleotides and can be delivered into cultured mammalian cells in less than 1 hour with relatively high efficiency (90%). Further, the interaction with MPG strongly increases both the stability of the oligonucleotide to nuclease and the ability to cross the plasma membrane (Morris *et al.*, 1997).

RIBOZYMES

Although proteins traditionally have been used for catalysis of nucleic acids, another class of macromolecules has emerged as useful in this endeavor. Ribozymes are RNA-protein complexes that cleave nucleic acids in a site-specific fashion. Ribozymes have specific catalytic domains that possess endonuclease activity (Kim and Cech, 1987; Gerlach *et al.*, 1987; Forster and Symons, 1987). For example, a large number of ribozymes accelerate phosphoester transfer reactions with a high degree of specificity, often cleaving only one of several phosphoesters in an oligonucleotide substrate (Cech *et al.*, 1981; Michel and Westhof, 1990; Reinhold-Hurek and Shub, 1992). This specificity has been attributed to the requirement that the substrate bind via specific base-pairing interactions to the internal guide sequence ("IGS") of the ribozyme prior to chemical reaction.

Ribozyme catalysis has primarily been observed as part of sequence-specific cleavage/ligation reactions involving nucleic acids (Joyce, 1989; Cech *et al.*, 1981). For example, U. S. Patent No. 5,354,855 (specifically incorporated herein by reference) reports that certain ribozymes can act as endonucleases with a sequence specificity greater than that of known ribonucleases and approaching that of the DNA restriction enzymes. Thus, sequence-specific ribozyme-mediated inhibition of gene expression may be particularly suited to therapeutic applications (Scanlon *et al.*, 1991; Sarver *et al.*, 1990). Recently, it was reported that ribozymes elicited genetic changes in some cells lines to which they were applied; the altered genes included the oncogenes H-*ras*, c-*fos* and genes of HIV. Most of this work involved the modification of a target mRNA, based on a specific mutant codon that is cleaved by a specific ribozyme.

Six basic varieties of naturally-occurring enzymatic RNAs are known presently. Each can catalyze the hydrolysis of RNA phosphodiester bonds *in trans* (and thus can cleave other RNA molecules) under physiological conditions. In general, enzymatic nucleic acids act by first binding to a target RNA. Such binding occurs through the target binding portion of a enzymatic nucleic acid which is held in close proximity to an enzymatic portion of the molecule that acts to cleave the target RNA. Thus, the enzymatic nucleic acid first recognizes and then binds a target RNA through complementary base-pairing, and once bound to the correct site, acts enzymatically to cut the target RNA. Strategic cleavage of such a target RNA will destroy its ability to direct synthesis of an encoded protein. After an enzymatic nucleic acid has bound and cleaved its RNA target, it is released from that RNA to search for another target and can repeatedly bind and cleave new targets.

The enzymatic nature of a ribozyme is advantageous over many technologies, such as antisense technology (where a nucleic acid molecule simply binds to a nucleic acid target to block its translation) since the concentration of ribozyme necessary to affect a therapeutic treatment is lower than that of an antisense oligonucleotide. This advantage reflects the ability of the ribozyme to act enzymatically. Thus, a single ribozyme molecule is able to cleave many molecules of target RNA. In addition, the ribozyme is a highly specific inhibitor, with the specificity of inhibition depending not only on the base pairing mechanism of binding to the target

RNA, but also on the mechanism of target RNA cleavage. Single mismatches, or base-substitutions, near the site of cleavage can completely eliminate catalytic activity of a ribozyme. Similar mismatches in antisense molecules do not prevent their action (Woolf *et al.*, 1992). Thus, the specificity of action of a ribozyme is greater than that of an antisense oligonucleotide binding the same RNA site.

The enzymatic nucleic acid molecule may be formed in a hammerhead, hairpin, a hepatitis δ virus, group I intron or RNaseP RNA (in association with an RNA guide sequence) or Neurospora VS RNA motif. Examples of hammerhead motifs are described by Rossi *et al.* (1992). Examples of hairpin motifs are described by Hampel *et al.* (Eur. Pat. Appl. Publ. No. EP 0360257), Hampel and Tritz (1989), Hampel *et al.* (1990) and U. S. Patent 5,631,359 (specifically incorporated herein by reference). An example of the hepatitis δ virus motif is described by Perrotta and Been (1992); an example of the RNaseP motif is described by Guerrier-Takada *et al.* (1983); Neurospora VS RNA ribozyme motif is described by Collins (Saville and Collins, 1990; Saville and Collins, 1991; Collins and Olive, 1993); and an example of the Group I intron is described in (U. S. Patent 4,987,071, specifically incorporated herein by reference). All that is important in an enzymatic nucleic acid molecule of this invention is that it has a specific substrate binding site which is complementary to one or more of the target gene RNA regions, and that it have nucleotide sequences within or surrounding that substrate binding site which impart an RNA cleaving activity to the molecule. Thus the ribozyme constructs need not be limited to specific motifs mentioned herein.

In certain embodiments, it may be important to produce enzymatic cleaving agents which exhibit a high degree of specificity for the RNA of a desired target, such as one of the sequences disclosed herein. The enzymatic nucleic acid molecule is preferably targeted to a highly conserved sequence region of a target mRNA. Such enzymatic nucleic acid molecules can be delivered exogenously to specific cells as required. Alternatively, the ribozymes can be expressed from DNA or RNA vectors that are delivered to specific cells.

Small enzymatic nucleic acid motifs (*e.g.*, of the hammerhead or the hairpin structure) may also be used for exogenous delivery. The simple structure of

these molecules increases the ability of the enzymatic nucleic acid to invade targeted regions of the mRNA structure. Alternatively, catalytic RNA molecules can be expressed within cells from eukaryotic promoters (*e.g.*, Scanlon *et al.*, 1991; Kashani-Sabet *et al.*, 1992; Dropulic *et al.*, 1992; Weerasinghe *et al.*, 1991; Ojwang *et al.*, 1992; Chen *et al.*, 1992; Sarver *et al.*, 1990). Those skilled in the art realize that any ribozyme can be expressed in eukaryotic cells from the appropriate DNA vector. The activity of such ribozymes can be augmented by their release from the primary transcript by a second ribozyme (Int. Pat. Appl. Publ. No. WO 93/23569, and Int. Pat. Appl. Publ. No. WO 94/02595, both hereby incorporated by reference; Ohkawa *et al.*, 1992; Taira *et al.*, 1991; and Ventura *et al.*, 1993).

Ribozymes may be added directly, or can be complexed with cationic lipids, lipid complexes, packaged within liposomes, or otherwise delivered to target cells. The RNA or RNA complexes can be locally administered to relevant tissues *ex vivo*, or *in vivo* through injection, aerosol inhalation, infusion pump or stent, with or without their incorporation in biopolymers.

Ribozymes may be designed as described in Int. Pat. Appl. Publ. No. WO 93/23569 and Int. Pat. Appl. Publ. No. WO 94/02595, each specifically incorporated herein by reference) and synthesized to be tested *in vitro* and *in vivo*, as described. Such ribozymes can also be optimized for delivery. While specific examples are provided, those in the art will recognize that equivalent RNA targets in other species can be utilized when necessary.

Hammerhead or hairpin ribozymes may be individually analyzed by computer folding (Jaeger *et al.*, 1989) to assess whether the ribozyme sequences fold into the appropriate secondary structure. Those ribozymes with unfavorable intramolecular interactions between the binding arms and the catalytic core are eliminated from consideration. Varying binding arm lengths can be chosen to optimize activity. Generally, at least 5 or so bases on each arm are able to bind to, or otherwise interact with, the target RNA.

Ribozymes of the hammerhead or hairpin motif may be designed to anneal to various sites in the mRNA message, and can be chemically synthesized. The method of synthesis used follows the procedure for normal RNA synthesis as described

in Usman *et al.* (1987) and in Scaringe *et al.* (1990) and makes use of common nucleic acid protecting and coupling groups, such as dimethoxytrityl at the 5'-end, and phosphoramidites at the 3'-end. Average stepwise coupling yields are typically >98%. Hairpin ribozymes may be synthesized in two parts and annealed to reconstruct an active ribozyme (Chowrira and Burke, 1992). Ribozymes may be modified extensively to enhance stability by modification with nuclease resistant groups, for example, 2'-amino, 2'-C-allyl, 2'-flouro, 2'-o-methyl, 2'-H (for a review see *e.g.*, Usman and Cedergren, 1992). Ribozymes may be purified by gel electrophoresis using general methods or by high pressure liquid chromatography and resuspended in water.

Ribozyme activity can be optimized by altering the length of the ribozyme binding arms, or chemically synthesizing ribozymes with modifications that prevent their degradation by serum ribonucleases (see *e.g.*, Int. Pat. Appl. Publ. No. WO 92/07065; Perrault *et al*, 1990; Pieken *et al.*, 1991; Usman and Cedergren, 1992; Int. Pat. Appl. Publ. No. WO 93/15187; Int. Pat. Appl. Publ. No. WO 91/03162; Eur. Pat. Appl. Publ. No. 92110298.4; U. S. Patent 5,334,711; and Int. Pat. Appl. Publ. No. WO 94/13688, which describe various chemical modifications that can be made to the sugar moieties of enzymatic RNA molecules), modifications which enhance their efficacy in cells, and removal of stem II bases to shorten RNA synthesis times and reduce chemical requirements.

Sullivan *et al.* (Int. Pat. Appl. Publ. No. WO 94/02595) describes the general methods for delivery of enzymatic RNA molecules. Ribozymes may be administered to cells by a variety of methods known to those familiar to the art, including, but not restricted to, encapsulation in liposomes, by iontophoresis, or by incorporation into other vehicles, such as hydrogels, cyclodextrins, biodegradable nanocapsules, and bioadhesive microspheres. For some indications, ribozymes may be directly delivered *ex vivo* to cells or tissues with or without the aforementioned vehicles. Alternatively, the RNA/vehicle combination may be locally delivered by direct inhalation, by direct injection or by use of a catheter, infusion pump or stent. Other routes of delivery include, but are not limited to, intravascular, intramuscular, subcutaneous or joint injection, aerosol inhalation, oral (tablet or pill form), topical, systemic, ocular, intraperitoneal and/or intrathecal delivery. More detailed descriptions

of ribozyme delivery and administration are provided in Int. Pat. Appl. Publ. No. WO 94/02595 and Int. Pat. Appl. Publ. No. WO 93/23569, each specifically incorporated herein by reference.

Another means of accumulating high concentrations of a ribozyme(s) within cells is to incorporate the ribozyme-encoding sequences into a DNA expression vector. Transcription of the ribozyme sequences are driven from a promoter for eukaryotic RNA polymerase I (pol I), RNA polymerase II (pol II), or RNA polymerase III (pol III). Transcripts from pol II or pol III promoters will be expressed at high levels in all cells; the levels of a given pol II promoter in a given cell type will depend on the nature of the gene regulatory sequences (enhancers, silencers, *etc.*) present nearby. Prokaryotic RNA polymerase promoters may also be used, providing that the prokaryotic RNA polymerase enzyme is expressed in the appropriate cells (Elroy-Stein and Moss, 1990; Gao and Huang, 1993; Lieber *et al.*, 1993; Zhou *et al.*, 1990). Ribozymes expressed from such promoters can function in mammalian cells (*e.g.* Kashani-Saber *et al.*, 1992; Ojwang *et al.*, 1992; Chen *et al.*, 1992; Yu *et al.*, 1993; L'Huillier *et al.*, 1992; Lisziewicz *et al.*, 1993). Such transcription units can be incorporated into a variety of vectors for introduction into mammalian cells, including but not restricted to, plasmid DNA vectors, viral DNA vectors (such as adenovirus or adeno-associated vectors), or viral RNA vectors (such as retroviral, semliki forest virus, sindbis virus vectors).

Ribozymes may be used as diagnostic tools to examine genetic drift and mutations within diseased cells. They can also be used to assess levels of the target RNA molecule. The close relationship between ribozyme activity and the structure of the target RNA allows the detection of mutations in any region of the molecule which alters the base-pairing and three-dimensional structure of the target RNA. By using multiple ribozymes, one may map nucleotide changes which are important to RNA structure and function *in vitro*, as well as in cells and tissues. Cleavage of target RNAs with ribozymes may be used to inhibit gene expression and define the role (essentially) of specified gene products in the progression of disease. In this manner, other genetic targets may be defined as important mediators of the disease. These studies will lead to better treatment of the disease progression by affording the possibility of combinational

therapies (*e.g.*, multiple ribozymes targeted to different genes, ribozymes coupled with known small molecule inhibitors, or intermittent treatment with combinations of ribozymes and/or other chemical or biological molecules). Other *in vitro* uses of ribozymes are well known in the art, and include detection of the presence of mRNA associated with an IL-5 related condition. Such RNA is detected by determining the presence of a cleavage product after treatment with a ribozyme using standard methodology.

PEPTIDE NUCLEIC ACIDS

In certain embodiments, the inventors contemplate the use of peptide nucleic acids (PNAs) in the practice of the methods of the invention. PNA is a DNA mimic in which the nucleobases are attached to a pseudopeptide backbone (Good and Nielsen, 1997). PNA is able to be utilized in a number methods that traditionally have used RNA or DNA. Often PNA sequences perform better in techniques than the corresponding RNA or DNA sequences and have utilities that are not inherent to RNA or DNA. A review of PNA including methods of making, characteristics of, and methods of using, is provided by Corey (1997) and is incorporated herein by reference. As such, in certain embodiments, one may prepare PNA sequences that are complementary to one or more portions of the ACE mRNA sequence, and such PNA compositions may be used to regulate, alter, decrease, or reduce the translation of ACE-specific mRNA, and thereby alter the level of ACE activity in a host cell to which such PNA compositions have been administered.

PNAs have 2-aminoethyl-glycine linkages replacing the normal phosphodiester backbone of DNA (Nielsen *et al.*, 1991; Hanvey *et al.*, 1992; Hyrup and Nielsen, 1996; Neilsen, 1996). This chemistry has three important consequences: firstly, in contrast to DNA or phosphorothioate oligonucleotides, PNAs are neutral molecules; secondly, PNAs are achiral, which avoids the need to develop a stereoselective synthesis; and thirdly, PNA synthesis uses standard Boc (Dueholm *et al.*, 1994) or Fmoc (Thomson *et al.*, 1995) protocols for solid-phase peptide synthesis, although other methods, including a modified Merrifield method, have been used (Christensen *et al.*, 1995).

PNA monomers or ready-made oligomers are commercially available from PerSeptive Biosystems (Framingham, MA). PNA syntheses by either Boc or Fmoc protocols are straightforward using manual or automated protocols (Norton *et al.*, 1995). The manual protocol lends itself to the production of chemically modified PNAs or the simultaneous synthesis of families of closely related PNAs.

As with peptide synthesis, the success of a particular PNA synthesis will depend on the properties of the chosen sequence. For example, while in theory PNAs can incorporate any combination of nucleotide bases, the presence of adjacent purines can lead to deletions of one or more residues in the product. In expectation of this difficulty, it is suggested that, in producing PNAs with adjacent purines, one should repeat the coupling of residues likely to be added inefficiently. This should be followed by the purification of PNAs by reverse-phase high-pressure liquid chromatography (Norton *et al.*, 1995) providing yields and purity of product similar to those observed during the synthesis of peptides.

Modifications of PNAs for a given application may be accomplished by coupling amino acids during solid-phase synthesis or by attaching compounds that contain a carboxylic acid group to the exposed N-terminal amine. Alternatively, PNAs can be modified after synthesis by coupling to an introduced lysine or cysteine. The ease with which PNAs can be modified facilitates optimization for better solubility or for specific functional requirements. Once synthesized, the identity of PNAs and their derivatives can be confirmed by mass spectrometry. Several studies have made and utilized modifications of PNAs (Norton *et al.*, 1995; Haaima *et al.*, 1996; Stetsenko *et al.*, 1996; Petersen *et al.*, 1995; Ulmann *et al.*, 1996; Koch *et al.*, 1995; Orum *et al.*, 1995; Footer *et al.*, 1996; Griffith *et al.*, 1995; Kremsky *et al.*, 1996; Pardridge *et al.*, 1995; Boffa *et al.*, 1995; Landsdorp *et al.*, 1996; Gambacorti-Passerini *et al.*, 1996; Armitage *et al.*, 1997; Seeger *et al.*, 1997; Ruskowski *et al.*, 1997). U.S. Patent No. 5,700,922 discusses PNA-DNA-PNA chimeric molecules and their uses in diagnostics, modulating protein in organisms, and treatment of conditions susceptible to therapeutics.

In contrast to DNA and RNA, which contain negatively charged linkages, the PNA backbone is neutral. In spite of this dramatic alteration, PNAs

recognize complementary DNA and RNA by Watson-Crick pairing (Egholm *et al.*, 1993), validating the initial modeling by Nielsen *et al.* (1991). PNAs lack 3′ to 5′ polarity and can bind in either parallel or antiparallel fashion, with the antiparallel mode being preferred (Egholm *et al.*, 1993).

Hybridization of DNA oligonucleotides to DNA and RNA is destabilized by electrostatic repulsion between the negatively charged phosphate backbones of the complementary strands. By contrast, the absence of charge repulsion in PNA-DNA or PNA-RNA duplexes increases the melting temperature (T_m) and reduces the dependence of T_m on the concentration of mono- or divalent cations (Nielsen *et al.*, 1991). The enhanced rate and affinity of hybridization are significant because they are responsible for the surprising ability of PNAs to perform strand invasion of complementary sequences within relaxed double-stranded DNA. In addition, the efficient hybridization at inverted repeats suggests that PNAs can recognize secondary structure effectively within double-stranded DNA. Enhanced recognition also occurs with PNAs immobilized on surfaces, and Wang *et al.* have shown that support-bound PNAs can be used to detect hybridization events (Wang *et al.*, 1996).

One might expect that tight binding of PNAs to complementary sequences would also increase binding to similar (but not identical) sequences, reducing the sequence specificity of PNA recognition. As with DNA hybridization, however, selective recognition can be achieved by balancing oligomer length and incubation temperature. Moreover, selective hybridization of PNAs is encouraged by PNA-DNA hybridization being less tolerant of base mismatches than DNA-DNA hybridization. For example, a single mismatch within a 16 bp PNA-DNA duplex can reduce the T_m by up to 15°C (Egholm *et al.*, 1993). This high level of discrimination has allowed the development of several PNA-based strategies for the analysis of point mutations (Wang *et al.*, 1996; Carlsson *et al.*, 1996; Thiede *et al.*, 1996; Webb and Hurskainen, 1996; Perry-O'Keefe *et al.*, 1996).

High-affinity binding provides clear advantages for molecular recognition and the development of new applications for PNAs. For example, 11-13 nucleotide PNAs inhibit the activity of telomerase, a ribonucleo-protein that extends

telomere ends using an essential RNA template, while the analogous DNA oligomers do not (Norton *et al.*, 1996).

Neutral PNAs are more hydrophobic than analogous DNA oligomers, and this can lead to difficulty solubilizing them at neutral pH, especially if the PNAs have a high purine content or if they have the potential to form secondary structures. Their solubility can be enhanced by attaching one or more positive charges to the PNA termini (Nielsen *et al.*, 1991).

Findings by Allfrey and colleagues suggest that strand invasion will occur spontaneously at sequences within chromosomal DNA (Boffa *et al.*, 1995; Boffa *et al.*, 1996). These studies targeted PNAs to triplet repeats of the nucleotides CAG and used this recognition to purify transcriptionally active DNA (Boffa *et al.*, 1995) and to inhibit transcription (Boffa *et al.*, 1996). This result suggests that if PNAs can be delivered within cells then they will have the potential to be general sequence-specific regulators of gene expression. Studies and reviews concerning the use of PNAs as antisense and anti-gene agents include Nielsen *et al.* (1993b), Hanvey *et al.* (1992), and Good and Nielsen (1997). Koppelhus *et al.* (1997) have used PNAs to inhibit HIV-1 inverse transcription, showing that PNAs may be used for antiviral therapies.

Methods of characterizing the antisense binding properties of PNAs are discussed in Rose (1993) and Jensen *et al.* (1997). Rose uses capillary gel electrophoresis to determine binding of PNAs to their complementary oligonucleotide, measuring the relative binding kinetics and stoichiometry. Similar types of measurements were made by Jensen *et al.* using BIAcore™ technology.

Other applications of PNAs include use in DNA strand invasion (Nielsen *et al.*, 1991), antisense inhibition (Hanvey *et al.*, 1992), mutational analysis (Orum *et al.*, 1993), enhancers of transcription (Mollegaard *et al.*, 1994), nucleic acid purification (Orum *et al.*, 1995), isolation of transcriptionally active genes (Boffa *et al.*, 1995), blocking of transcription factor binding (Vickers *et al.*, 1995), genome cleavage (Veselkov *et al.*, 1996), biosensors (Wang *et al.*, 1996), *in situ* hybridization (Thisted *et al.*, 1996), and in a alternative to Southern blotting (Perry-O'Keefe, 1996).

POLYPEPTIDE COMPOSITIONS

The present invention, in other aspects, provides polypeptide compositions. Generally, a polypeptide of the invention will be an isolated polypeptide (or an epitope, variant, or active fragment thereof) derived from a mammalian species. Preferably, the polypeptide is encoded by a polynucleotide sequence disclosed herein or a sequence which hybridizes under moderately stringent conditions to a polynucleotide sequence disclosed herein. Alternatively, the polypeptide may be defined as a polypeptide which comprises a contiguous amino acid sequence from an amino acid sequence disclosed herein, or which polypeptide comprises an entire amino acid sequence disclosed herein.

In the present invention, a polypeptide composition is also understood to comprise one or more polypeptides that are immunologically reactive with antibodies generated against a polypeptide of the invention, particularly a polypeptide having the amino acid sequence disclosed in SEQ ID NO: 786, 787, 791, 793, 795, 797-799, 806 or 809, or to active fragments, or to variants or biological functional equivalents thereof.

Likewise, a polypeptide composition of the present invention is understood to comprise one or more polypeptides that are capable of eliciting antibodies that are immunologically reactive with one or more polypeptides encoded by one or more contiguous nucleic acid sequences contained in SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826, or to active fragments, or to variants thereof, or to one or more nucleic acid sequences which hybridize to one or more of these sequences under conditions of moderate to high stringency. Particularly illustrative polypeptides include the amino acid sequences disclosed in SEQ ID NO: 786, 787, 791, 793, 795, 797-799, 806, 809 and 827.

As used herein, an active fragment of a polypeptide includes a whole or a portion of a polypeptide which is modified by conventional techniques, *e.g.*, mutagenesis, or by addition, deletion, or substitution, but which active fragment exhibits substantially the same structure function, antigenicity, etc., as a polypeptide as described herein.

In certain illustrative embodiments, the polypeptides of the invention will comprise at least an immunogenic portion of a lung tumor protein or a variant thereof, as described herein. As noted above, a " lung tumor protein" is a protein that is expressed by lung tumor cells. Proteins that are lung tumor proteins also react detectably within an immunoassay (such as an ELISA) with antisera from a patient with lung cancer. Polypeptides as described herein may be of any length. Additional sequences derived from the native protein and/or heterologous sequences may be present, and such sequences may (but need not) possess further immunogenic or antigenic properties.

An “immunogenic portion,” as used herein is a portion of a protein that is recognized (*i.e.*, specifically bound) by a B-cell and/or T-cell surface antigen receptor. Such immunogenic portions generally comprise at least 5 amino acid residues, more preferably at least 10, and still more preferably at least 20 amino acid residues of a lung tumor protein or a variant thereof. Certain preferred immunogenic portions include peptides in which an N-terminal leader sequence and/or transmembrane domain have been deleted. Other preferred immunogenic portions may contain a small N- and/or C-terminal deletion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids), relative to the mature protein.

Immunogenic portions may generally be identified using well known techniques, such as those summarized in Paul, *Fundamental Immunology*, 3rd ed., 243-247 (Raven Press, 1993) and references cited therein. Such techniques include screening polypeptides for the ability to react with antigen-specific antibodies, antisera and/or T-cell lines or clones. As used herein, antisera and antibodies are "antigen-specific" if they specifically bind to an antigen (*i.e.*, they react with the protein in an ELISA or other immunoassay, and do not react detectably with unrelated proteins). Such antisera and antibodies may be prepared as described herein, and using well

known techniques. An immunogenic portion of a native lung tumor protein is a portion that reacts with such antisera and/or T-cells at a level that is not substantially less than the reactivity of the full length polypeptide (*e.g.*, in an ELISA and/or T-cell reactivity assay). Such immunogenic portions may react within such assays at a level that is similar to or greater than the reactivity of the full length polypeptide. Such screens may generally be performed using methods well known to those of ordinary skill in the art, such as those described in Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. For example, a polypeptide may be immobilized on a solid support and contacted with patient sera to allow binding of antibodies within the sera to the immobilized polypeptide. Unbound sera may then be removed and bound antibodies detected using, for example, ^{125}I-labeled Protein A.

As noted above, a composition may comprise a variant of a native lung tumor protein. A polypeptide "variant," as used herein, is a polypeptide that differs from a native lung tumor protein in one or more substitutions, deletions, additions and/or insertions, such that the immunogenicity of the polypeptide is not substantially diminished. In other words, the ability of a variant to react with antigen-specific antisera may be enhanced or unchanged, relative to the native protein, or may be diminished by less than 50%, and preferably less than 20%, relative to the native protein. Such variants may generally be identified by modifying one of the above polypeptide sequences and evaluating the reactivity of the modified polypeptide with antigen-specific antibodies or antisera as described herein. Preferred variants include those in which one or more portions, such as an N-terminal leader sequence or transmembrane domain, have been removed. Other preferred variants include variants in which a small portion (*e.g.*, 1-30 amino acids, preferably 5-15 amino acids) has been removed from the N- and/or C-terminal of the mature protein.

Polypeptide variants encompassed by the present invention include those exhibiting at least about 70%, 75%, 80%, 85%, 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98%, or 99% or more identity (determined as described above) to the polypeptides disclosed herein.

Preferably, a variant contains conservative substitutions. A "conservative substitution" is one in which an amino acid is substituted for another

amino acid that has similar properties, such that one skilled in the art of peptide chemistry would expect the secondary structure and hydropathic nature of the polypeptide to be substantially unchanged. Amino acid substitutions may generally be made on the basis of similarity in polarity, charge, solubility, hydrophobicity, hydrophilicity and/or the amphipathic nature of the residues. For example, negatively charged amino acids include aspartic acid and glutamic acid; positively charged amino acids include lysine and arginine; and amino acids with uncharged polar head groups having similar hydrophilicity values include leucine, isoleucine and valine; glycine and alanine; asparagine and glutamine; and serine, threonine, phenylalanine and tyrosine. Other groups of amino acids that may represent conservative changes include: (1) ala, pro, gly, glu, asp, gln, asn, ser, thr; (2) cys, ser, tyr, thr; (3) val, ile, leu, met, ala, phe; (4) lys, arg, his; and (5) phe, tyr, trp, his. A variant may also, or alternatively, contain nonconservative changes. In a preferred embodiment, variant polypeptides differ from a native sequence by substitution, deletion or addition of five amino acids or fewer. Variants may also (or alternatively) be modified by, for example, the deletion or addition of amino acids that have minimal influence on the immunogenicity, secondary structure and hydropathic nature of the polypeptide.

As noted above, polypeptides may comprise a signal (or leader) sequence at the N-terminal end of the protein, which co-translationally or post-translationally directs transfer of the protein. The polypeptide may also be conjugated to a linker or other sequence for ease of synthesis, purification or identification of the polypeptide (*e.g.*, poly-His), or to enhance binding of the polypeptide to a solid support. For example, a polypeptide may be conjugated to an immunoglobulin Fc region.

Polypeptides may be prepared using any of a variety of well known techniques. Recombinant polypeptides encoded by DNA sequences as described above may be readily prepared from the DNA sequences using any of a variety of expression vectors known to those of ordinary skill in the art. Expression may be achieved in any appropriate host cell that has been transformed or transfected with an expression vector containing a DNA molecule that encodes a recombinant polypeptide. Suitable host cells include prokaryotes, yeast, and higher eukaryotic cells, such as mammalian cells and plant cells. Preferably, the host cells employed are *E. coli*, yeast or a mammalian

cell line such as COS or CHO. Supernatants from suitable host/vector systems which secrete recombinant protein or polypeptide into culture media may be first concentrated using a commercially available filter. Following concentration, the concentrate may be applied to a suitable purification matrix such as an affinity matrix or an ion exchange resin. Finally, one or more reverse phase HPLC steps can be employed to further purify a recombinant polypeptide.

Portions and other variants having less than about 100 amino acids, and generally less than about 50 amino acids, may also be generated by synthetic means, using techniques well known to those of ordinary skill in the art. For example, such polypeptides may be synthesized using any of the commercially available solid-phase techniques, such as the Merrifield solid-phase synthesis method, where amino acids are sequentially added to a growing amino acid chain. *See* Merrifield, *J. Am. Chem. Soc. 85*:2149-2146, 1963. Equipment for automated synthesis of polypeptides is commercially available from suppliers such as Perkin Elmer/Applied BioSystems Division (Foster City, CA), and may be operated according to the manufacturer's instructions.

Within certain specific embodiments, a polypeptide may be a fusion protein that comprises multiple polypeptides as described herein, or that comprises at least one polypeptide as described herein and an unrelated sequence, such as a known tumor protein. A fusion partner may, for example, assist in providing T helper epitopes (an immunological fusion partner), preferably T helper epitopes recognized by humans, or may assist in expressing the protein (an expression enhancer) at higher yields than the native recombinant protein. Certain preferred fusion partners are both immunological and expression enhancing fusion partners. Other fusion partners may be selected so as to increase the solubility of the protein or to enable the protein to be targeted to desired intracellular compartments. Still further fusion partners include affinity tags, which facilitate purification of the protein.

Fusion proteins may generally be prepared using standard techniques, including chemical conjugation. Preferably, a fusion protein is expressed as a recombinant protein, allowing the production of increased levels, relative to a non-fused protein, in an expression system. Briefly, DNA sequences encoding the polypeptide

components may be assembled separately, and ligated into an appropriate expression vector. The 3' end of the DNA sequence encoding one polypeptide component is ligated, with or without a peptide linker, to the 5' end of a DNA sequence encoding the second polypeptide component so that the reading frames of the sequences are in phase. This permits translation into a single fusion protein that retains the biological activity of both component polypeptides.

A peptide linker sequence may be employed to separate the first and second polypeptide components by a distance sufficient to ensure that each polypeptide folds into its secondary and tertiary structures. Such a peptide linker sequence is incorporated into the fusion protein using standard techniques well known in the art. Suitable peptide linker sequences may be chosen based on the following factors: (1) their ability to adopt a flexible extended conformation; (2) their inability to adopt a secondary structure that could interact with functional epitopes on the first and second polypeptides; and (3) the lack of hydrophobic or charged residues that might react with the polypeptide functional epitopes. Preferred peptide linker sequences contain Gly, Asn and Ser residues. Other near neutral amino acids, such as Thr and Ala may also be used in the linker sequence. Amino acid sequences which may be usefully employed as linkers include those disclosed in Maratea *et al.*, *Gene 40*:39-46, 1985; Murphy *et al.*, *Proc. Natl. Acad. Sci. USA 83*:8258-8262, 1986; U.S. Patent No. 4,935,233 and U.S. Patent No. 4,751,180. The linker sequence may generally be from 1 to about 50 amino acids in length. Linker sequences are not required when the first and second polypeptides have non-essential N-terminal amino acid regions that can be used to separate the functional domains and prevent steric interference.

The ligated DNA sequences are operably linked to suitable transcriptional or translational regulatory elements. The regulatory elements responsible for expression of DNA are located only 5' to the DNA sequence encoding the first polypeptides. Similarly, stop codons required to end translation and transcription termination signals are only present 3' to the DNA sequence encoding the second polypeptide.

Fusion proteins are also provided. Such proteins comprise a polypeptide as described herein together with an unrelated immunogenic protein. Preferably the

immunogenic protein is capable of eliciting a recall response. Examples of such proteins include tetanus, tuberculosis and hepatitis proteins (*see*, for example, Stoute *et al. New Engl. J. Med.*, *336*:86-91, 1997).

Within preferred embodiments, an immunological fusion partner is derived from protein D, a surface protein of the gram-negative bacterium Haemophilus influenza B (WO 91/18926). Preferably, a protein D derivative comprises approximately the first third of the protein (*e.g.*, the first N-terminal 100-110 amino acids), and a protein D derivative may be lipidated. Within certain preferred embodiments, the first 109 residues of a Lipoprotein D fusion partner is included on the N-terminus to provide the polypeptide with additional exogenous T-cell epitopes and to increase the expression level in *E. coli* (thus functioning as an expression enhancer). The lipid tail ensures optimal presentation of the antigen to antigen presenting cells. Other fusion partners include the non-structural protein from influenzae virus, NS1 (hemaglutinin). Typically, the N-terminal 81 amino acids are used, although different fragments that include T-helper epitopes may be used.

In another embodiment, the immunological fusion partner is the protein known as LYTA, or a portion thereof (preferably a C-terminal portion). LYTA is derived from *Streptococcus pneumoniae*, which synthesizes an N-acetyl-L-alanine amidase known as amidase LYTA (encoded by the LytA gene; *Gene 43*:265-292, 1986). LYTA is an autolysin that specifically degrades certain bonds in the peptidoglycan backbone. The C-terminal domain of the LYTA protein is responsible for the affinity to the choline or to some choline analogues such as DEAE. This property has been exploited for the development of *E. coli* C-LYTA expressing plasmids useful for expression of fusion proteins. Purification of hybrid proteins containing the C-LYTA fragment at the amino terminus has been described (*see Biotechnology 10*:795-798, 1992). Within a preferred embodiment, a repeat portion of LYTA may be incorporated into a fusion protein. A repeat portion is found in the C-terminal region starting at residue 178. A particularly preferred repeat portion incorporates residues 188-305.

In general, polypeptides (including fusion proteins) and polynucleotides as described herein are isolated. An "isolated" polypeptide or polynucleotide is one that

is removed from its original environment. For example, a naturally-occurring protein is isolated if it is separated from some or all of the coexisting materials in the natural system. Preferably, such polypeptides are at least about 90% pure, more preferably at least about 95% pure and most preferably at least about 99% pure. A polynucleotide is considered to be isolated if, for example, it is cloned into a vector that is not a part of the natural environment.

BINDING AGENTS

The present invention further provides agents, such as antibodies and antigen-binding fragments thereof, that specifically bind to a lung tumor protein. As used herein, an antibody, or antigen-binding fragment thereof, is said to "specifically bind" to a lung tumor protein if it reacts at a detectable level (within, for example, an ELISA) with a lung tumor protein, and does not react detectably with unrelated proteins under similar conditions. As used herein, "binding" refers to a noncovalent association between two separate molecules such that a complex is formed. The ability to bind may be evaluated by, for example, determining a binding constant for the formation of the complex. The binding constant is the value obtained when the concentration of the complex is divided by the product of the component concentrations. In general, two compounds are said to "bind," in the context of the present invention, when the binding constant for complex formation exceeds about 10^3 L/mol. The binding constant may be determined using methods well known in the art.

Binding agents may be further capable of differentiating between patients with and without a cancer, such as lung cancer, using the representative assays provided herein. In other words, antibodies or other binding agents that bind to a lung tumor protein will generate a signal indicating the presence of a cancer in at least about 20% of patients with the disease, and will generate a negative signal indicating the absence of the disease in at least about 90% of individuals without the cancer. To determine whether a binding agent satisfies this requirement, biological samples (*e.g.*, blood, sera, sputum, urine and/or tumor biopsies) from patients with and without a cancer (as determined using standard clinical tests) may be assayed as described herein for the presence of polypeptides that bind to the binding agent. It will be apparent that a

statistically significant number of samples with and without the disease should be assayed. Each binding agent should satisfy the above criteria; however, those of ordinary skill in the art will recognize that binding agents may be used in combination to improve sensitivity.

Any agent that satisfies the above requirements may be a binding agent. For example, a binding agent may be a ribosome, with or without a peptide component, an RNA molecule or a polypeptide. In a preferred embodiment, a binding agent is an antibody or an antigen-binding fragment thereof. Antibodies may be prepared by any of a variety of techniques known to those of ordinary skill in the art. *See, e.g.*, Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, antibodies can be produced by cell culture techniques, including the generation of monoclonal antibodies as described herein, or via transfection of antibody genes into suitable bacterial or mammalian cell hosts, in order to allow for the production of recombinant antibodies. In one technique, an immunogen comprising the polypeptide is initially injected into any of a wide variety of mammals (*e.g.*, mice, rats, rabbits, sheep or goats). In this step, the polypeptides of this invention may serve as the immunogen without modification. Alternatively, particularly for relatively short polypeptides, a superior immune response may be elicited if the polypeptide is joined to a carrier protein, such as bovine serum albumin or keyhole limpet hemocyanin. The immunogen is injected into the animal host, preferably according to a predetermined schedule incorporating one or more booster immunizations, and the animals are bled periodically. Polyclonal antibodies specific for the polypeptide may then be purified from such antisera by, for example, affinity chromatography using the polypeptide coupled to a suitable solid support.

Monoclonal antibodies specific for an antigenic polypeptide of interest may be prepared, for example, using the technique of Kohler and Milstein, *Eur. J. Immunol.* 6:511-519, 1976, and improvements thereto. Briefly, these methods involve the preparation of immortal cell lines capable of producing antibodies having the desired specificity (*i.e.*, reactivity with the polypeptide of interest). Such cell lines may be produced, for example, from spleen cells obtained from an animal immunized as described above. The spleen cells are then immortalized by, for example, fusion with a

myeloma cell fusion partner, preferably one that is syngeneic with the immunized animal. A variety of fusion techniques may be employed. For example, the spleen cells and myeloma cells may be combined with a nonionic detergent for a few minutes and then plated at low density on a selective medium that supports the growth of hybrid cells, but not myeloma cells. A preferred selection technique uses HAT (hypoxanthine, aminopterin, thymidine) selection. After a sufficient time, usually about 1 to 2 weeks, colonies of hybrids are observed. Single colonies are selected and their culture supernatants tested for binding activity against the polypeptide. Hybridomas having high reactivity and specificity are preferred.

Monoclonal antibodies may be isolated from the supernatants of growing hybridoma colonies. In addition, various techniques may be employed to enhance the yield, such as injection of the hybridoma cell line into the peritoneal cavity of a suitable vertebrate host, such as a mouse. Monoclonal antibodies may then be harvested from the ascites fluid or the blood. Contaminants may be removed from the antibodies by conventional techniques, such as chromatography, gel filtration, precipitation, and extraction. The polypeptides of this invention may be used in the purification process in, for example, an affinity chromatography step.

Within certain embodiments, the use of antigen-binding fragments of antibodies may be preferred. Such fragments include Fab fragments, which may be prepared using standard techniques. Briefly, immunoglobulins may be purified from rabbit serum by affinity chromatography on Protein A bead columns (Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988) and digested by papain to yield Fab and Fc fragments. The Fab and Fc fragments may be separated by affinity chromatography on protein A bead columns.

Monoclonal antibodies of the present invention may be coupled to one or more therapeutic agents. Suitable agents in this regard include radionuclides, differentiation inducers, drugs, toxins, and derivatives thereof. Preferred radionuclides include ^{90}Y, ^{123}I, ^{125}I, ^{131}I, ^{186}Re, ^{188}Re, ^{211}At, and ^{212}Bi. Preferred drugs include methotrexate, and pyrimidine and purine analogs. Preferred differentiation inducers include phorbol esters and butyric acid. Preferred toxins include ricin, abrin, diptheria

toxin, cholera toxin, gelonin, Pseudomonas exotoxin, Shigella toxin, and pokeweed antiviral protein.

A therapeutic agent may be coupled (*e.g.*, covalently bonded) to a suitable monoclonal antibody either directly or indirectly (*e.g.*, via a linker group). A direct reaction between an agent and an antibody is possible when each possesses a substituent capable of reacting with the other. For example, a nucleophilic group, such as an amino or sulfhydryl group, on one may be capable of reacting with a carbonyl-containing group, such as an anhydride or an acid halide, or with an alkyl group containing a good leaving group (*e.g.*, a halide) on the other.

Alternatively, it may be desirable to couple a therapeutic agent and an antibody via a linker group. A linker group can function as a spacer to distance an antibody from an agent in order to avoid interference with binding capabilities. A linker group can also serve to increase the chemical reactivity of a substituent on an agent or an antibody, and thus increase the coupling efficiency. An increase in chemical reactivity may also facilitate the use of agents, or functional groups on agents, which otherwise would not be possible.

It will be evident to those skilled in the art that a variety of bifunctional or polyfunctional reagents, both homo- and hetero-functional (such as those described in the catalog of the Pierce Chemical Co., Rockford, IL), may be employed as the linker group. Coupling may be effected, for example, through amino groups, carboxyl groups, sulfhydryl groups or oxidized carbohydrate residues. There are numerous references describing such methodology, *e.g.*, U.S. Patent No. 4,671,958, to Rodwell *et al.*

Where a therapeutic agent is more potent when free from the antibody portion of the immunoconjugates of the present invention, it may be desirable to use a linker group which is cleavable during or upon internalization into a cell. A number of different cleavable linker groups have been described. The mechanisms for the intracellular release of an agent from these linker groups include cleavage by reduction of a disulfide bond (*e.g.*, U.S. Patent No. 4,489,710, to Spitler), by irradiation of a photolabile bond (*e.g.*, U.S. Patent No. 4,625,014, to Senter *et al.*), by hydrolysis of derivatized amino acid side chains (*e.g.*, U.S. Patent No. 4,638,045, to Kohn *et al.*), by

serum complement-mediated hydrolysis (*e.g.*, U.S. Patent No. 4,671,958, to Rodwell *et al.*), and acid-catalyzed hydrolysis (*e.g.*, U.S. Patent No. 4,569,789, to Blattler *et al.*).

It may be desirable to couple more than one agent to an antibody. In one embodiment, multiple molecules of an agent are coupled to one antibody molecule. In another embodiment, more than one type of agent may be coupled to one antibody. Regardless of the particular embodiment, immunoconjugates with more than one agent may be prepared in a variety of ways. For example, more than one agent may be coupled directly to an antibody molecule, or linkers that provide multiple sites for attachment can be used. Alternatively, a carrier can be used.

A carrier may bear the agents in a variety of ways, including covalent bonding either directly or via a linker group. Suitable carriers include proteins such as albumins (*e.g.*, U.S. Patent No. 4,507,234, to Kato *et al.*), peptides and polysaccharides such as aminodextran (*e.g.*, U.S. Patent No. 4,699,784, to Shih *et al.*). A carrier may also bear an agent by noncovalent bonding or by encapsulation, such as within a liposome vesicle (*e.g.*, U.S. Patent Nos. 4,429,008 and 4,873,088). Carriers specific for radionuclide agents include radiohalogenated small molecules and chelating compounds. For example, U.S. Patent No. 4,735,792 discloses representative radiohalogenated small molecules and their synthesis. A radionuclide chelate may be formed from chelating compounds that include those containing nitrogen and sulfur atoms as the donor atoms for binding the metal, or metal oxide, radionuclide. For example, U.S. Patent No. 4,673,562, to Davison *et al.* discloses representative chelating compounds and their synthesis.

A variety of routes of administration for the antibodies and immunoconjugates may be used. Typically, administration will be intravenous, intramuscular, subcutaneous or in the bed of a resected tumor. It will be evident that the precise dose of the antibody/immunoconjugate will vary depending upon the antibody used, the antigen density on the tumor, and the rate of clearance of the antibody.

T CELLS

Immunotherapeutic compositions may also, or alternatively, comprise T cells specific for a lung tumor protein. Such cells may generally be prepared *in vitro* or *ex vivo*, using standard procedures. For example, T cells may be isolated from bone marrow, peripheral blood, or a fraction of bone marrow or peripheral blood of a patient, using a commercially available cell separation system, such as the Isolex™ System, available from Nexell Therapeutics, Inc. (Irvine, CA; see also U.S. Patent No. 5,240,856; U.S. Patent No. 5,215,926; WO 89/06280; WO 91/16116 and WO 92/07243). Alternatively, T cells may be derived from related or unrelated humans, non-human mammals, cell lines or cultures.

T cells may be stimulated with a lung tumor polypeptide, polynucleotide encoding a lung tumor polypeptide and/or an antigen presenting cell (APC) that expresses such a polypeptide. Such stimulation is performed under conditions and for a time sufficient to permit the generation of T cells that are specific for the polypeptide. Preferably, a lung tumor polypeptide or polynucleotide is present within a delivery vehicle, such as a microsphere, to facilitate the generation of specific T cells.

T cells are considered to be specific for a lung tumor polypeptide if the T cells specifically proliferate, secrete cytokines or kill target cells coated with the polypeptide or expressing a gene encoding the polypeptide. T cell specificity may be evaluated using any of a variety of standard techniques. For example, within a chromium release assay or proliferation assay, a stimulation index of more than two fold increase in lysis and/or proliferation, compared to negative controls, indicates T cell specificity. Such assays may be performed, for example, as described in Chen *et al.*, *Cancer Res.* *54*:1065-1070, 1994. Alternatively, detection of the proliferation of T cells may be accomplished by a variety of known techniques. For example, T cell proliferation can be detected by measuring an increased rate of DNA synthesis (*e.g.*, by pulse-labeling cultures of T cells with tritiated thymidine and measuring the amount of tritiated thymidine incorporated into DNA). Contact with a lung tumor polypeptide (100 ng/ml - 100 μg/ml, preferably 200 ng/ml - 25 μg/ml) for 3 - 7 days should result in at least a two fold increase in proliferation of the T cells. Contact as described above for 2-3 hours should result in activation of the T cells, as measured using standard

cytokine assays in which a two fold increase in the level of cytokine release (*e.g.*, TNF or IFN-γ) is indicative of T cell activation (*see* Coligan *et al.*, Current Protocols in Immunology, vol. 1, Wiley Interscience (Greene 1998)). T cells that have been activated in response to a lung tumor polypeptide, polynucleotide or polypeptide-expressing APC may be $CD4^+$ and/or $CD8^+$. Lung tumor protein specific T cells may be expanded using standard techniques. Within preferred embodiments, the T cells are derived from a patient, a related donor or an unrelated donor, and are administered to the patient following stimulation and expansion.

For therapeutic purposes, $CD4^+$ or $CD8^+$ T cells that proliferate in response to a lung tumor polypeptide, polynucleotide or APC can be expanded in number either *in vitro* or *in vivo*. Proliferation of such T cells *in vitro* may be accomplished in a variety of ways. For example, the T cells can be re-exposed to a lung tumor polypeptide, or a short peptide corresponding to an immunogenic portion of such a polypeptide, with or without the addition of T cell growth factors, such as interleukin-2, and/or stimulator cells that synthesize a lung tumor polypeptide. Alternatively, one or more T cells that proliferate in the presence of a lung tumor protein can be expanded in number by cloning. Methods for cloning cells are well known in the art, and include limiting dilution.

PHARMACEUTICAL COMPOSITIONS

In additional embodiments, the present invention concerns formulation of one or more of the polynucleotide, polypeptide, T-cell and/or antibody compositions disclosed herein in pharmaceutically-acceptable solutions for administration to a cell or an animal, either alone, or in combination with one or more other modalities of therapy.

It will also be understood that, if desired, the nucleic acid segment, RNA, DNA or PNA compositions that express a polypeptide as disclosed herein may be administered in combination with other agents as well, such as, *e.g.*, other proteins or polypeptides or various pharmaceutically-active agents. In fact, there is virtually no limit to other components that may also be included, given that the additional agents do not cause a significant adverse effect upon contact with the target cells or host tissues. The compositions may thus be delivered along with various other agents as required in

the particular instance. Such compositions may be purified from host cells or other biological sources, or alternatively may be chemically synthesized as described herein. Likewise, such compositions may further comprise substituted or derivatized RNA or DNA compositions.

Formulation of pharmaceutically-acceptable excipients and carrier solutions is well-known to those of skill in the art, as is the development of suitable dosing and treatment regimens for using the particular compositions described herein in a variety of treatment regimens, including *e.g.*, oral, parenteral, intravenous, intranasal, and intramuscular administration and formulation.

1. ORAL DELIVERY

In certain applications, the pharmaceutical compositions disclosed herein may be delivered *via* oral administration to an animal. As such, these compositions may be formulated with an inert diluent or with an assimilable edible carrier, or they may be enclosed in hard- or soft-shell gelatin capsule, or they may be compressed into tablets, or they may be incorporated directly with the food of the diet.

The active compounds may even be incorporated with excipients and used in the form of ingestible tablets, buccal tables, troches, capsules, elixirs, suspensions, syrups, wafers, and the like (Mathiowitz *et al.*, 1997; Hwang *et al.*, 1998; U. S. Patent 5,641,515; U. S. Patent 5,580,579 and U. S. Patent 5,792,451, each specifically incorporated herein by reference in its entirety). The tablets, troches, pills, capsules and the like may also contain the following: a binder, as gum tragacanth, acacia, cornstarch, or gelatin; excipients, such as dicalcium phosphate; a disintegrating agent, such as corn starch, potato starch, alginic acid and the like; a lubricant, such as magnesium stearate; and a sweetening agent, such as sucrose, lactose or saccharin may be added or a flavoring agent, such as peppermint, oil of wintergreen, or cherry flavoring. When the dosage unit form is a capsule, it may contain, in addition to materials of the above type, a liquid carrier. Various other materials may be present as coatings or to otherwise modify the physical form of the dosage unit. For instance, tablets, pills, or capsules may be coated with shellac, sugar, or both. A syrup of elixir may contain the active compound sucrose as a sweetening agent methyl and

propylparabens as preservatives, a dye and flavoring, such as cherry or orange flavor. Of course, any material used in preparing any dosage unit form should be pharmaceutically pure and substantially non-toxic in the amounts employed. In addition, the active compounds may be incorporated into sustained-release preparation and formulations.

Typically, these formulations may contain at least about 0.1% of the active compound or more, although the percentage of the active ingredient(s) may, of course, be varied and may conveniently be between about 1 or 2% and about 60% or 70% or more of the weight or volume of the total formulation. Naturally, the amount of active compound(s) in each therapeutically useful composition may be prepared is such a way that a suitable dosage will be obtained in any given unit dose of the compound. Factors such as solubility, bioavailability, biological half-life, route of administration, product shelf life, as well as other pharmacological considerations will be contemplated by one skilled in the art of preparing such pharmaceutical formulations, and as such, a variety of dosages and treatment regimens may be desirable.

For oral administration the compositions of the present invention may alternatively be incorporated with one or more excipients in the form of a mouthwash, dentifrice, buccal tablet, oral spray, or sublingual orally-administered formulation. For example, a mouthwash may be prepared incorporating the active ingredient in the required amount in an appropriate solvent, such as a sodium borate solution (Dobell's Solution). Alternatively, the active ingredient may be incorporated into an oral solution such as one containing sodium borate, glycerin and potassium bicarbonate, or dispersed in a dentifrice, or added in a therapeutically-effective amount to a composition that may include water, binders, abrasives, flavoring agents, foaming agents, and humectants. Alternatively the compositions may be fashioned into a tablet or solution form that may be placed under the tongue or otherwise dissolved in the mouth.

2. Injectable Delivery

In certain circumstances it will be desirable to deliver the pharmaceutical compositions disclosed herein parenterally, intravenously, intramuscularly, or even intraperitoneally as described in U. S. Patent 5,543,158; U. S. Patent 5,641,515 and U.

S. Patent 5,399,363 (each specifically incorporated herein by reference in its entirety). Solutions of the active compounds as free base or pharmacologically acceptable salts may be prepared in water suitably mixed with a surfactant, such as hydroxypropylcellulose. Dispersions may also be prepared in glycerol, liquid polyethylene glycols, and mixtures thereof and in oils. Under ordinary conditions of storage and use, these preparations contain a preservative to prevent the growth of microorganisms.

The pharmaceutical forms suitable for injectable use include sterile aqueous solutions or dispersions and sterile powders for the extemporaneous preparation of sterile injectable solutions or dispersions (U. S. Patent 5,466,468, specifically incorporated herein by reference in its entirety). In all cases the form must be sterile and must be fluid to the extent that easy syringability exists. It must be stable under the conditions of manufacture and storage and must be preserved against the contaminating action of microorganisms, such as bacteria and fungi. The carrier can be a solvent or dispersion medium containing, for example, water, ethanol, polyol (*e.g.*, glycerol, propylene glycol, and liquid polyethylene glycol, and the like), suitable mixtures thereof, and/or vegetable oils. Proper fluidity may be maintained, for example, by the use of a coating, such as lecithin, by the maintenance of the required particle size in the case of dispersion and by the use of surfactants. The prevention of the action of microorganisms can be facilitated by various antibacterial and antifungal agents, for example, parabens, chlorobutanol, phenol, sorbic acid, thimerosal, and the like. In many cases, it will be preferable to include isotonic agents, for example, sugars or sodium chloride. Prolonged absorption of the injectable compositions can be brought about by the use in the compositions of agents delaying absorption, for example, aluminum monostearate and gelatin.

For parenteral administration in an aqueous solution, for example, the solution should be suitably buffered if necessary and the liquid diluent first rendered isotonic with sufficient saline or glucose. These particular aqueous solutions are especially suitable for intravenous, intramuscular, subcutaneous and intraperitoneal administration. In this connection, a sterile aqueous medium that can be employed will be known to those of skill in the art in light of the present disclosure. For example, one

dosage may be dissolved in 1 ml of isotonic NaCl solution and either added to 1000 ml of hypodermoclysis fluid or injected at the proposed site of infusion, (see for example, "Remington's Pharmaceutical Sciences" 15th Edition, pages 1035-1038 and 1570-1580). Some variation in dosage will necessarily occur depending on the condition of the subject being treated. The person responsible for administration will, in any event, determine the appropriate dose for the individual subject. Moreover, for human administration, preparations should meet sterility, pyrogenicity, and the general safety and purity standards as required by FDA Office of Biologics standards.

Sterile injectable solutions are prepared by incorporating the active compounds in the required amount in the appropriate solvent with various of the other ingredients enumerated above, as required, followed by filtered sterilization. Generally, dispersions are prepared by incorporating the various sterilized active ingredients into a sterile vehicle which contains the basic dispersion medium and the required other ingredients from those enumerated above. In the case of sterile powders for the preparation of sterile injectable solutions, the preferred methods of preparation are vacuum-drying and freeze-drying techniques which yield a powder of the active ingredient plus any additional desired ingredient from a previously sterile-filtered solution thereof.

The compositions disclosed herein may be formulated in a neutral or salt form. Pharmaceutically-acceptable salts, include the acid addition salts (formed with the free amino groups of the protein) and which are formed with inorganic acids such as, for example, hydrochloric or phosphoric acids, or such organic acids as acetic, oxalic, tartaric, mandelic, and the like. Salts formed with the free carboxyl groups can also be derived from inorganic bases such as, for example, sodium, potassium, ammonium, calcium, or ferric hydroxides, and such organic bases as isopropylamine, trimethylamine, histidine, procaine and the like. Upon formulation, solutions will be administered in a manner compatible with the dosage formulation and in such amount as is therapeutically effective. The formulations are easily administered in a variety of dosage forms such as injectable solutions, drug-release capsules, and the like.

As used herein, "carrier" includes any and all solvents, dispersion media, vehicles, coatings, diluents, antibacterial and antifungal agents, isotonic and absorption

delaying agents, buffers, carrier solutions, suspensions, colloids, and the like. The use of such media and agents for pharmaceutical active substances is well known in the art. Except insofar as any conventional media or agent is incompatible with the active ingredient, its use in the therapeutic compositions is contemplated. Supplementary active ingredients can also be incorporated into the compositions.

The phrase "pharmaceutically-acceptable" refers to molecular entities and compositions that do not produce an allergic or similar untoward reaction when administered to a human. The preparation of an aqueous composition that contains a protein as an active ingredient is well understood in the art. Typically, such compositions are prepared as injectables, either as liquid solutions or suspensions; solid forms suitable for solution in, or suspension in, liquid prior to injection can also be prepared. The preparation can also be emulsified.

3. NASAL DELIVERY

In certain embodiments, the pharmaceutical compositions may be delivered by intranasal sprays, inhalation, and/or other aerosol delivery vehicles. Methods for delivering genes, nucleic acids, and peptide compositions directly to the lungs *via* nasal aerosol sprays has been described *e.g.*, in U. S. Patent 5,756,353 and U. S. Patent 5,804,212 (each specifically incorporated herein by reference in its entirety). Likewise, the delivery of drugs using intranasal microparticle resins (Takenaga *et al.*, 1998) and lysophosphatidyl-glycerol compounds (U. S. Patent 5,725,871, specifically incorporated herein by reference in its entirety) are also well-known in the pharmaceutical arts. Likewise, transmucosal drug delivery in the form of a polytetrafluoroetheylene support matrix is described in U. S. Patent 5,780,045 (specifically incorporated herein by reference in its entirety).

4. LIPOSOME-, NANOCAPSULE-, AND MICROPARTICLE-MEDIATED DELIVERY

In certain embodiments, the inventors contemplate the use of liposomes, nanocapsules, microparticles, microspheres, lipid particles, vesicles, and the like, for the introduction of the compositions of the present invention into suitable host cells. In particular, the compositions of the present invention may be formulated for delivery

either encapsulated in a lipid particle, a liposome, a vesicle, a nanosphere, or a nanoparticle or the like.

Such formulations may be preferred for the introduction of pharmaceutically-acceptable formulations of the nucleic acids or constructs disclosed herein. The formation and use of liposomes is generally known to those of skill in the art (see for example, Couvreur *et al.*, 1977; Couvreur, 1988; Lasic, 1998; which describes the use of liposomes and nanocapsules in the targeted antibiotic therapy for intracellular bacterial infections and diseases). Recently, liposomes were developed with improved serum stability and circulation half-times (Gabizon and Papahadjopoulos, 1988; Allen and Choun, 1987; U. S. Patent 5,741,516, specifically incorporated herein by reference in its entirety). Further, various methods of liposome and liposome like preparations as potential drug carriers have been reviewed (Takakura, 1998; Chandran *et al.*, 1997; Margalit, 1995; U. S. Patent 5,567,434; U. S. Patent 5,552,157; U. S. Patent 5,565,213; U. S. Patent 5,738,868 and U. S. Patent 5,795,587, each specifically incorporated herein by reference in its entirety).

Liposomes have been used successfully with a number of cell types that are normally resistant to transfection by other procedures including T cell suspensions, primary hepatocyte cultures and PC 12 cells (Renneisen *et al.*, 1990; Muller *et al.*, 1990). In addition, liposomes are free of the DNA length constraints that are typical of viral-based delivery systems. Liposomes have been used effectively to introduce genes, drugs (Heath and Martin, 1986; Heath *et al.*, 1986; Balazsovits *et al.*, 1989; Fresta and Puglisi, 1996), radiotherapeutic agents (Pikul *et al.*, 1987), enzymes (Imaizumi *et al.*, 1990a; Imaizumi *et al.*, 1990b), viruses (Faller and Baltimore, 1984), transcription factors and allosteric effectors (Nicolau and Gersonde, 1979) into a variety of cultured cell lines and animals. In addition, several successful clinical trails examining the effectiveness of liposome-mediated drug delivery have been completed (Lopez-Berestein *et al.*, 1985a; 1985b; Coune, 1988; Sculier *et al.*, 1988). Furthermore, several studies suggest that the use of liposomes is not associated with autoimmune responses, toxicity or gonadal localization after systemic delivery (Mori and Fukatsu, 1992).

Liposomes are formed from phospholipids that are dispersed in an aqueous medium and spontaneously form multilamellar concentric bilayer vesicles

(also termed multilamellar vesicles (MLVs). MLVs generally have diameters of from 25 nm to 4 μm. Sonication of MLVs results in the formation of small unilamellar vesicles (SUVs) with diameters in the range of 200 to 500 Å, containing an aqueous solution in the core.

Liposomes bear resemblance to cellular membranes and are contemplated for use in connection with the present invention as carriers for the peptide compositions. They are widely suitable as both water- and lipid-soluble substances can be entrapped, *i.e.* in the aqueous spaces and within the bilayer itself, respectively. It is possible that the drug-bearing liposomes may even be employed for site-specific delivery of active agents by selectively modifying the liposomal formulation.

In addition to the teachings of Couvreur *et al.* (1977; 1988), the following information may be utilized in generating liposomal formulations. Phospholipids can form a variety of structures other than liposomes when dispersed in water, depending on the molar ratio of lipid to water. At low ratios the liposome is the preferred structure. The physical characteristics of liposomes depend on pH, ionic strength and the presence of divalent cations. Liposomes can show low permeability to ionic and polar substances, but at elevated temperatures undergo a phase transition which markedly alters their permeability. The phase transition involves a change from a closely packed, ordered structure, known as the gel state, to a loosely packed, less-ordered structure, known as the fluid state. This occurs at a characteristic phase-transition temperature and results in an increase in permeability to ions, sugars and drugs.

In addition to temperature, exposure to proteins can alter the permeability of liposomes. Certain soluble proteins, such as cytochrome c, bind, deform and penetrate the bilayer, thereby causing changes in permeability. Cholesterol inhibits this penetration of proteins, apparently by packing the phospholipids more tightly. It is contemplated that the most useful liposome formations for antibiotic and inhibitor delivery will contain cholesterol.

The ability to trap solutes varies between different types of liposomes. For example, MLVs are moderately efficient at trapping solutes, but SUVs are extremely inefficient. SUVs offer the advantage of homogeneity and reproducibility in

size distribution, however, and a compromise between size and trapping efficiency is offered by large unilamellar vesicles (LUVs). These are prepared by ether evaporation and are three to four times more efficient at solute entrapment than MLVs.

In addition to liposome characteristics, an important determinant in entrapping compounds is the physicochemical properties of the compound itself. Polar compounds are trapped in the aqueous spaces and nonpolar compounds bind to the lipid bilayer of the vesicle. Polar compounds are released through permeation or when the bilayer is broken, but nonpolar compounds remain affiliated with the bilayer unless it is disrupted by temperature or exposure to lipoproteins. Both types show maximum efflux rates at the phase transition temperature.

Liposomes interact with cells *via* four different mechanisms: endocytosis by phagocytic cells of the reticuloendothelial system such as macrophages and neutrophils; adsorption to the cell surface, either by nonspecific weak hydrophobic or electrostatic forces, or by specific interactions with cell-surface components; fusion with the plasma cell membrane by insertion of the lipid bilayer of the liposome into the plasma membrane, with simultaneous release of liposomal contents into the cytoplasm; and by transfer of liposomal lipids to cellular or subcellular membranes, or vice versa, without any association of the liposome contents. It often is difficult to determine which mechanism is operative and more than one may operate at the same time.

The fate and disposition of intravenously injected liposomes depend on their physical properties, such as size, fluidity, and surface charge. They may persist in tissues for h or days, depending on their composition, and half lives in the blood range from min to several h. Larger liposomes, such as MLVs and LUVs, are taken up rapidly by phagocytic cells of the reticuloendothelial system, but physiology of the circulatory system restrains the exit of such large species at most sites. They can exit only in places where large openings or pores exist in the capillary endothelium, such as the sinusoids of the liver or spleen. Thus, these organs are the predominate site of uptake. On the other hand, SUVs show a broader tissue distribution but still are sequestered highly in the liver and spleen. In general, this *in vivo* behavior limits the potential targeting of liposomes to only those organs and tissues accessible to their large size. These include the blood, liver, spleen, bone marrow, and lymphoid organs.

Targeting is generally not a limitation in terms of the present invention. However, should specific targeting be desired, methods are available for this to be accomplished. Antibodies may be used to bind to the liposome surface and to direct the antibody and its drug contents to specific antigenic receptors located on a particular cell-type surface. Carbohydrate determinants (glycoprotein or glycolipid cell-surface components that play a role in cell-cell recognition, interaction and adhesion) may also be used as recognition sites as they have potential in directing liposomes to particular cell types. Mostly, it is contemplated that intravenous injection of liposomal preparations would be used, but other routes of administration are also conceivable.

Alternatively, the invention provides for pharmaceutically-acceptable nanocapsule formulations of the compositions of the present invention. Nanocapsules can generally entrap compounds in a stable and reproducible way (Henry-Michelland *et al.*, 1987; Quintanar-Guerrero *et al.*, 1998; Douglas *et al.*, 1987). To avoid side effects due to intracellular polymeric overloading, such ultrafine particles (sized around 0.1 μm) should be designed using polymers able to be degraded *in vivo*. Biodegradable polyalkyl-cyanoacrylate nanoparticles that meet these requirements are contemplated for use in the present invention. Such particles may be are easily made, as described (Couvreur *et al.*, 1980; 1988; zur Muhlen *et al.*, 1998; Zambaux *et al.* 1998; Pinto-Alphandry *et al.*, 1995 and U. S. Patent 5,145,684, specifically incorporated herein by reference in its entirety).

IMMUNOGENIC COMPOSITIONS

In certain preferred embodiments of the present invention, immunogenic compositions, or vaccines, are provided. The immunogenic compositions will generally comprise one or more pharmaceutical compositions, such as those discussed above, in combination with an immunostimulant. An immunostimulant may be any substance that enhances or potentiates an immune response (antibody and/or cell-mediated) to an exogenous antigen. Examples of immunostimulants include adjuvants, biodegradable microspheres (*e.g.*, polylactic galactide) and liposomes (into which the compound is incorporated; *see e.g.*, Fullerton, U.S. Patent No. 4,235,877). Vaccine preparation is generally described in, for example, M.F. Powell and M.J. Newman, eds., "Vaccine

Design (the subunit and adjuvant approach)," Plenum Press (NY, 1995). Pharmaceutical compositions and immunogenic compositions, or vaccines, within the scope of the present invention may also contain other compounds, which may be biologically active or inactive. For example, one or more immunogenic portions of other tumor antigens may be present, either incorporated into a fusion polypeptide or as a separate compound, within the composition.

Illustrative immunogenic compositions may contain DNA encoding one or more of the polypeptides as described above, such that the polypeptide is generated *in situ*. As noted above, the DNA may be present within any of a variety of delivery systems known to those of ordinary skill in the art, including nucleic acid expression systems, bacteria and viral expression systems. Numerous gene delivery techniques are well known in the art, such as those described by Rolland, *Crit. Rev. Therap. Drug Carrier Systems 15*:143-198, 1998, and references cited therein. Appropriate nucleic acid expression systems contain the necessary DNA sequences for expression in the patient (such as a suitable promoter and terminating signal). Bacterial delivery systems involve the administration of a bacterium (such as *Bacillus-Calmette-Guerrin*) that expresses an immunogenic portion of the polypeptide on its cell surface or secretes such an epitope. In a preferred embodiment, the DNA may be introduced using a viral expression system (*e.g.*, vaccinia or other pox virus, retrovirus, or adenovirus), which may involve the use of a non-pathogenic (defective), replication competent virus. Suitable systems are disclosed, for example, in Fisher-Hoch *et al.*, *Proc. Natl. Acad. Sci. USA 86*:317-321, 1989; Flexner *et al.*, *Ann. N.Y. Acad. Sci. 569*:86-103, 1989; Flexner *et al.*, *Vaccine 8*:17-21, 1990; U.S. Patent Nos. 4,603,112, 4,769,330, and 5,017,487; WO 89/01973; U.S. Patent No. 4,777,127; GB 2,200,651; EP 0,345,242; WO 91/02805; Berkner, *Biotechniques 6*:616-627, 1988; Rosenfeld *et al.*, *Science 252*:431-434, 1991; Kolls *et al.*, *Proc. Natl. Acad. Sci. USA 91*:215-219, 1994; Kass-Eisler *et al.*, *Proc. Natl. Acad. Sci. USA 90*:11498-11502, 1993; Guzman *et al.*, *Circulation 88*:2838-2848, 1993; and Guzman *et al.*, *Cir. Res. 73*:1202-1207, 1993. Techniques for incorporating DNA into such expression systems are well known to those of ordinary skill in the art. The DNA may also be "naked," as described, for example, in Ulmer *et al.*, *Science 259*:1745-1749, 1993 and reviewed by Cohen,

Science 259:1691-1692, 1993. The uptake of naked DNA may be increased by coating the DNA onto biodegradable beads, which are efficiently transported into the cells. It will be apparent that an immunogenic composition may comprise both a polynucleotide and a polypeptide component. Such immunogenic compositions may provide for an enhanced immune response.

It will be apparent that an immunogenic composition may contain pharmaceutically acceptable salts of the polynucleotides and polypeptides provided herein. Such salts may be prepared from pharmaceutically acceptable non-toxic bases, including organic bases (*e.g.*, salts of primary, secondary and tertiary amines and basic amino acids) and inorganic bases (*e.g.*, sodium, potassium, lithium, ammonium, calcium and magnesium salts).

While any suitable carrier known to those of ordinary skill in the art may be employed in the immunogenic compositions of this invention, the type of carrier will vary depending on the mode of administration. Compositions of the present invention may be formulated for any appropriate manner of administration, including for example, topical, oral, nasal, intravenous, intracranial, intraperitoneal, subcutaneous or intramuscular administration. For parenteral administration, such as subcutaneous injection, the carrier preferably comprises water, saline, alcohol, a fat, a wax or a buffer. For oral administration, any of the above carriers or a solid carrier, such as mannitol, lactose, starch, magnesium stearate, sodium saccharine, talcum, cellulose, glucose, sucrose, and magnesium carbonate, may be employed. Biodegradable microspheres (*e.g.*, polylactate polyglycolate) may also be employed as carriers for the pharmaceutical compositions of this invention. Suitable biodegradable microspheres are disclosed, for example, in U.S. Patent Nos. 4,897,268; 5,075,109; 5,928,647; 5,811,128; 5,820,883; 5,853,763; 5,814,344 and 5,942,252. One may also employ a carrier comprising the particulate-protein complexes described in U.S. Patent No. 5,928,647, which are capable of inducing a class I-restricted cytotoxic T lymphocyte responses in a host.

Such compositions may also comprise buffers (*e.g.*, neutral buffered saline or phosphate buffered saline), carbohydrates (*e.g.*, glucose, mannose, sucrose or dextrans), mannitol, proteins, polypeptides or amino acids such as glycine, antioxidants,

bacteriostats, chelating agents such as EDTA or glutathione, adjuvants (*e.g.*, aluminum hydroxide), solutes that render the formulation isotonic, hypotonic or weakly hypertonic with the blood of a recipient, suspending agents, thickening agents and/or preservatives. Alternatively, compositions of the present invention may be formulated as a lyophilizate. Compounds may also be encapsulated within liposomes using well known technology.

Any of a variety of immunostimulants may be employed in the immunogenic compositions of this invention. For example, an adjuvant may be included. Most adjuvants contain a substance designed to protect the antigen from rapid catabolism, such as aluminum hydroxide or mineral oil, and a stimulator of immune responses, such as lipid A, *Bortadella pertussis* or *Mycobacterium tuberculosis* derived proteins. Suitable adjuvants are commercially available as, for example, Freund's Incomplete Adjuvant and Complete Adjuvant (Difco Laboratories, Detroit, MI); Merck Adjuvant 65 (Merck and Company, Inc., Rahway, NJ); AS-2 (SmithKline Beecham, Philadelphia, PA); aluminum salts such as aluminum hydroxide gel (alum) or aluminum phosphate; salts of calcium, iron or zinc; an insoluble suspension of acylated tyrosine; acylated sugars; cationically or anionically derivatized polysaccharides; polyphosphazenes; biodegradable microspheres; monophosphoryl lipid A and quil A. Cytokines, such as GM-CSF or interleukin-2, -7, or -12, may also be used as adjuvants.

Within the immunogenic compositions provided herein, the adjuvant composition is preferably designed to induce an immune response predominantly of the Th1 type. High levels of Th1-type cytokines (*e.g.*, IFN-γ, TNFα, IL-2 and IL-12) tend to favor the induction of cell mediated immune responses to an administered antigen. In contrast, high levels of Th2-type cytokines (*e.g.*, IL-4, IL-5, IL-6 and IL-10) tend to favor the induction of humoral immune responses. Following application of an immunogenic composition as provided herein, a patient will support an immune response that includes Th1- and Th2-type responses. Within a preferred embodiment, in which a response is predominantly Th1-type, the level of Th1-type cytokines will increase to a greater extent than the level of Th2-type cytokines. The levels of these cytokines may be readily assessed using standard assays. For a review of the families of cytokines, see Mosmann and Coffman, *Ann. Rev. Immunol.* 7:145-173, 1989.

Preferred adjuvants for use in eliciting a predominantly Th1-type response include, for example, a combination of monophosphoryl lipid A, preferably 3-de-O-acylated monophosphoryl lipid A (3D-MPL), together with an aluminum salt. MPL adjuvants are available from Corixa Corporation (Seattle, WA; *see* US Patent Nos. 4,436,727; 4,877,611; 4,866,034 and 4,912,094). CpG-containing oligonucleotides (in which the CpG dinucleotide is unmethylated) also induce a predominantly Th1 response. Such oligonucleotides are well known and are described, for example, in WO 96/02555, WO 99/33488 and U.S. Patent Nos. 6,008,200 and 5,856,462. Immunostimulatory DNA sequences are also described, for example, by Sato *et al.*, *Science 273*:352, 1996. Another preferred adjuvant is a saponin, preferably QS21 (Aquila Biopharmaceuticals Inc., Framingham, MA), which may be used alone or in combination with other adjuvants. For example, an enhanced system involves the combination of a monophosphoryl lipid A and saponin derivative, such as the combination of QS21 and 3D-MPL as described in WO 94/00153, or a less reactogenic composition where the QS21 is quenched with cholesterol, as described in WO 96/33739. Other preferred formulations comprise an oil-in-water emulsion and tocopherol. A particularly potent adjuvant formulation involving QS21, 3D-MPL and tocopherol in an oil-in-water emulsion is described in WO 95/17210.

Other preferred adjuvants include Montanide ISA 720 (Seppic, France), SAF (Chiron, California, United States), ISCOMS (CSL), MF-59 (Chiron), the SBAS series of adjuvants (*e.g.*, SBAS-2 or SBAS-4, available from SmithKline Beecham, Rixensart, Belgium), Detox (Corixa, Hamilton, MT), RC-529 (Corixa, Hamilton, MT) and other aminoalkyl glucosaminide 4-phosphates (AGPs), such as those described in pending U.S. Patent Application Serial Nos. 08/853,826 and 09/074,720, the disclosures of which are incorporated herein by reference in their entireties.

Any immunogenic composition provided herein may be prepared using well known methods that result in a combination of antigen, immune response enhancer and a suitable carrier or excipient. The compositions described herein may be administered as part of a sustained release formulation (*i.e.*, a formulation such as a capsule, sponge or gel (composed of polysaccharides, for example) that effects a slow release of compound following administration). Such formulations may generally be

prepared using well known technology (*see, e.g.*, Coombes *et al.*, *Vaccine 14*:1429-1438, 1996) and administered by, for example, oral, rectal or subcutaneous implantation, or by implantation at the desired target site. Sustained-release formulations may contain a polypeptide, polynucleotide or antibody dispersed in a carrier matrix and/or contained within a reservoir surrounded by a rate-controlling membrane.

Carriers for use within such formulations are biocompatible, and may also be biodegradable; preferably the formulation provides a relatively constant level of active component release. Such carriers include microparticles of poly(lactide-co-glycolide), polyacrylate, latex, starch, cellulose, dextran and the like. Other delayed-release carriers include supramolecular biovectors, which comprise a non-liquid hydrophilic core (*e.g.*, a cross-linked polysaccharide or oligosaccharide) and, optionally, an external layer comprising an amphiphilic compound, such as a phospholipid (*see e.g.*, U.S. Patent No. 5,151,254 and PCT applications WO 94/20078, WO/94/23701 and WO 96/06638). The amount of active compound contained within a sustained release formulation depends upon the site of implantation, the rate and expected duration of release and the nature of the condition to be treated or prevented.

Any of a variety of delivery vehicles may be employed within pharmaceutical compositions and immunogenic compositions to facilitate production of an antigen-specific immune response that targets tumor cells. Delivery vehicles include antigen presenting cells (APCs), such as dendritic cells, macrophages, B cells, monocytes and other cells that may be engineered to be efficient APCs. Such cells may, but need not, be genetically modified to increase the capacity for presenting the antigen, to improve activation and/or maintenance of the T cell response, to have anti-tumor effects *per se* and/or to be immunologically compatible with the receiver (*i.e.*, matched HLA haplotype). APCs may generally be isolated from any of a variety of biological fluids and organs, including tumor and peritumoral tissues, and may be autologous, allogeneic, syngeneic or xenogeneic cells.

Certain preferred embodiments of the present invention use dendritic cells or progenitors thereof as antigen-presenting cells. Dendritic cells are highly potent APCs (Banchereau and Steinman, *Nature 392*:245-251, 1998) and have been shown to

be effective as a physiological adjuvant for eliciting prophylactic or therapeutic antitumor immunity (*see* Timmerman and Levy, *Ann. Rev. Med.* *50*:507-529, 1999). In general, dendritic cells may be identified based on their typical shape (stellate *in situ*, with marked cytoplasmic processes (dendrites) visible *in vitro*), their ability to take up, process and present antigens with high efficiency and their ability to activate naïve T cell responses. Dendritic cells may, of course, be engineered to express specific cell-surface receptors or ligands that are not commonly found on dendritic cells *in vivo* or *ex vivo*, and such modified dendritic cells are contemplated by the present invention. As an alternative to dendritic cells, secreted vesicles antigen-loaded dendritic cells (called exosomes) may be used within a vaccine, or immunogenic composition (*see* Zitvogel *et al.*, *Nature Med.* *4*:594-600, 1998).

Dendritic cells and progenitors may be obtained from peripheral blood, bone marrow, tumor-infiltrating cells, peritumoral tissues-infiltrating cells, lymph nodes, spleen, skin, umbilical cord blood or any other suitable tissue or fluid. For example, dendritic cells may be differentiated *ex vivo* by adding a combination of cytokines such as GM-CSF, IL-4, IL-13 and/or TNFα to cultures of monocytes harvested from peripheral blood. Alternatively, CD34 positive cells harvested from peripheral blood, umbilical cord blood or bone marrow may be differentiated into dendritic cells by adding to the culture medium combinations of GM-CSF, IL-3, TNFα, CD40 ligand, LPS, flt3 ligand and/or other compound(s) that induce differentiation, maturation and proliferation of dendritic cells.

Dendritic cells are conveniently categorized as "immature" and "mature" cells, which allows a simple way to discriminate between two well characterized phenotypes. However, this nomenclature should not be construed to exclude all possible intermediate stages of differentiation. Immature dendritic cells are characterized as APC with a high capacity for antigen uptake and processing, which correlates with the high expression of Fcγ receptor and mannose receptor. The mature phenotype is typically characterized by a lower expression of these markers, but a high expression of cell surface molecules responsible for T cell activation such as class I and class II MHC, adhesion molecules (*e.g.*, CD54 and CD11) and costimulatory molecules (*e.g.*, CD40, CD80, CD86 and 4-1BB).

APCs may generally be transfected with a polynucleotide encoding a lung tumor protein (or portion or other variant thereof) such that the lung tumor polypeptide, or an immunogenic portion thereof, is expressed on the cell surface. Such transfection may take place *ex vivo*, and a composition comprising such transfected cells may then be used for therapeutic purposes, as described herein. Alternatively, a gene delivery vehicle that targets a dendritic or other antigen presenting cell may be administered to a patient, resulting in transfection that occurs *in vivo*. *In vivo* and *ex vivo* transfection of dendritic cells, for example, may generally be performed using any methods known in the art, such as those described in WO 97/24447, or the gene gun approach described by Mahvi *et al.*, *Immunology and cell Biology* 75:456-460, 1997. Antigen loading of dendritic cells may be achieved by incubating dendritic cells or progenitor cells with the lung tumor polypeptide, DNA (naked or within a plasmid vector) or RNA; or with antigen-expressing recombinant bacterium or viruses (*e.g.*, vaccinia, fowlpox, adenovirus or lentivirus vectors). Prior to loading, the polypeptide may be covalently conjugated to an immunological partner that provides T cell help (*e.g.*, a carrier molecule). Alternatively, a dendritic cell may be pulsed with a non-conjugated immunological partner, separately or in the presence of the polypeptide.

Immunogenic compositions and pharmaceutical compositions may be presented in unit-dose or multi-dose containers, such as sealed ampoules or vials. Such containers are preferably hermetically sealed to preserve sterility of the formulation until use. In general, formulations may be stored as suspensions, solutions or emulsions in oily or aqueous vehicles. Alternatively, an immunogenic or pharmaceutical composition may be stored in a freeze-dried condition requiring only the addition of a sterile liquid carrier immediately prior to use.

CANCER THERAPY

In further aspects of the present invention, the compositions described herein may be used for immunotherapy of cancer, such as lung cancer. Within such methods, compositions are typically administered to a patient. As used herein, a "patient" refers to any warm-blooded animal, preferably a human. A patient may or may not be afflicted with cancer. Accordingly, the above pharmaceutical compositions

and immunogenic compositions may be used to prevent the development of a cancer or to treat a patient afflicted with a cancer. A cancer may be diagnosed using criteria generally accepted in the art, including the presence of a malignant tumor. Pharmaceutical compositions and immunogenic composition s may be administered either prior to or following surgical removal of primary tumors and/or treatment such as administration of radiotherapy or conventional chemotherapeutic drugs. Administration may be by any suitable method, including administration by intravenous, intraperitoneal, intramuscular, subcutaneous, intranasal, intradermal, anal, vaginal, topical and oral routes.

Within certain embodiments, immunotherapy may be active immunotherapy, in which treatment relies on the *in vivo* stimulation of the endogenous host immune system to react against tumors with the administration of immune response-modifying agents (such as polypeptides and polynucleotides as provided herein).

Within other embodiments, immunotherapy may be passive immunotherapy, in which treatment involves the delivery of agents with established tumor-immune reactivity (such as effector cells or antibodies) that can directly or indirectly mediate antitumor effects and does not necessarily depend on an intact host immune system. Examples of effector cells include T cells as discussed above, T lymphocytes (such as $CD8^+$ cytotoxic T lymphocytes and $CD4^+$ T-helper tumor-infiltrating lymphocytes), killer cells (such as Natural Killer cells and lymphokine-activated killer cells), B cells and antigen-presenting cells (such as dendritic cells and macrophages) expressing a polypeptide provided herein. T cell receptors and antibody receptors specific for the polypeptides recited herein may be cloned, expressed and transferred into other vectors or effector cells for adoptive immunotherapy. The polypeptides provided herein may also be used to generate antibodies or anti-idiotypic antibodies (as described above and in U.S. Patent No. 4,918,164) for passive immunotherapy.

Effector cells may generally be obtained in sufficient quantities for adoptive immunotherapy by growth *in vitro*, as described herein. Culture conditions for expanding single antigen-specific effector cells to several billion in number with

retention of antigen recognition *in vivo* are well known in the art. Such *in vitro* culture conditions typically use intermittent stimulation with antigen, often in the presence of cytokines (such as IL-2) and non-dividing feeder cells. As noted above, immunoreactive polypeptides as provided herein may be used to rapidly expand antigen-specific T cell cultures in order to generate a sufficient number of cells for immunotherapy. In particular, antigen-presenting cells, such as dendritic, macrophage, monocyte, fibroblast and/or B cells, may be pulsed with immunoreactive polypeptides or transfected with one or more polynucleotides using standard techniques well known in the art. For example, antigen-presenting cells can be transfected with a polynucleotide having a promoter appropriate for increasing expression in a recombinant virus or other expression system. Cultured effector cells for use in therapy must be able to grow and distribute widely, and to survive long term *in vivo*. Studies have shown that cultured effector cells can be induced to grow in vivo and to survive long term in substantial numbers by repeated stimulation with antigen supplemented with IL-2 (*see*, for example, Cheever *et al.*, *Immunological Reviews 157*:177, 1997).

Alternatively, a vector expressing a polypeptide recited herein may be introduced into antigen presenting cells taken from a patient and clonally propagated *ex vivo* for transplant back into the same patient. Transfected cells may be reintroduced into the patient using any means known in the art, preferably in sterile form by intravenous, intracavitary, intraperitoneal or intratumor administration.

Routes and frequency of administration of the therapeutic compositions described herein, as well as dosage, will vary from individual to individual, and may be readily established using standard techniques. In general, the pharmaceutical compositions and immunogenic compositions may be administered by injection (*e.g.*, intracutaneous, intramuscular, intravenous or subcutaneous), intranasally (*e.g.*, by aspiration) or orally. Preferably, between 1 and 10 doses may be administered over a 52 week period. Preferably, 6 doses are administered, at intervals of 1 month, and booster vaccinations may be given periodically thereafter. Alternate protocols may be appropriate for individual patients. A suitable dose is an amount of a compound that, when administered as described above, is capable of promoting an anti-tumor immune response, and is at least 10-50% above the basal (*i.e.*, untreated) level. Such response

can be monitored by measuring the anti-tumor antibodies in a patient or by vaccine-dependent generation of cytolytic effector cells capable of killing the patient's tumor cells *in vitro*. Such vaccines, or immunogenic compositions, should also be capable of causing an immune response that leads to an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial or longer disease-free survival) in vaccinated patients as compared to non-vaccinated patients. In general, for compositions comprising one or more polypeptides, the amount of each polypeptide present in a dose ranges from about 25 μg to 5 mg per kg of host. Suitable dose sizes will vary with the size of the patient, but will typically range from about 0.1 mL to about 5 mL.

In general, an appropriate dosage and treatment regimen provides the active compound(s) in an amount sufficient to provide therapeutic and/or prophylactic benefit. Such a response can be monitored by establishing an improved clinical outcome (*e.g.*, more frequent remissions, complete or partial, or longer disease-free survival) in treated patients as compared to non-treated patients. Increases in preexisting immune responses to a lung tumor protein generally correlate with an improved clinical outcome. Such immune responses may generally be evaluated using standard proliferation, cytotoxicity or cytokine assays, which may be performed using samples obtained from a patient before and after treatment.

CANCER DETECTION AND DIAGNOSIS

In general, a cancer may be detected in a patient based on the presence of one or more lung tumor proteins and/or polynucleotides encoding such proteins in a biological sample (for example, blood, sera, sputum urine and/or tumor biopsies) obtained from the patient. In other words, such proteins may be used as markers to indicate the presence or absence of a cancer such as lung cancer. In addition, such proteins may be useful for the detection of other cancers. The binding agents provided herein generally permit detection of the level of antigen that binds to the agent in the biological sample. Polynucleotide primers and probes may be used to detect the level of mRNA encoding a tumor protein, which is also indicative of the presence or absence of a cancer. In general, a lung tumor sequence should be present at a level that is at least three fold higher in tumor tissue than in normal tissue

There are a variety of assay formats known to those of ordinary skill in the art for using a binding agent to detect polypeptide markers in a sample. *See*, *e.g.*, Harlow and Lane, *Antibodies: A Laboratory Manual*, Cold Spring Harbor Laboratory, 1988. In general, the presence or absence of a cancer in a patient may be determined by (a) contacting a biological sample obtained from a patient with a binding agent; (b) detecting in the sample a level of polypeptide that binds to the binding agent; and (c) comparing the level of polypeptide with a predetermined cut-off value.

In a preferred embodiment, the assay involves the use of binding agent immobilized on a solid support to bind to and remove the polypeptide from the remainder of the sample. The bound polypeptide may then be detected using a detection reagent that contains a reporter group and specifically binds to the binding agent/polypeptide complex. Such detection reagents may comprise, for example, a binding agent that specifically binds to the polypeptide or an antibody or other agent that specifically binds to the binding agent, such as an anti-immunoglobulin, protein G, protein A or a lectin. Alternatively, a competitive assay may be utilized, in which a polypeptide is labeled with a reporter group and allowed to bind to the immobilized binding agent after incubation of the binding agent with the sample. The extent to which components of the sample inhibit the binding of the labeled polypeptide to the binding agent is indicative of the reactivity of the sample with the immobilized binding agent. Suitable polypeptides for use within such assays include full length lung tumor proteins and portions thereof to which the binding agent binds, as described above.

The solid support may be any material known to those of ordinary skill in the art to which the tumor protein may be attached. For example, the solid support may be a test well in a microtiter plate or a nitrocellulose or other suitable membrane. Alternatively, the support may be a bead or disc, such as glass, fiberglass, latex or a plastic material such as polystyrene or polyvinylchloride. The support may also be a magnetic particle or a fiber optic sensor, such as those disclosed, for example, in U.S. Patent No. 5,359,681. The binding agent may be immobilized on the solid support using a variety of techniques known to those of skill in the art, which are amply described in the patent and scientific literature. In the context of the present invention, the term "immobilization" refers to both noncovalent association, such as adsorption,

and covalent attachment (which may be a direct linkage between the agent and functional groups on the support or may be a linkage by way of a cross-linking agent). Immobilization by adsorption to a well in a microtiter plate or to a membrane is preferred. In such cases, adsorption may be achieved by contacting the binding agent, in a suitable buffer, with the solid support for a suitable amount of time. The contact time varies with temperature, but is typically between about 1 hour and about 1 day. In general, contacting a well of a plastic microtiter plate (such as polystyrene or polyvinylchloride) with an amount of binding agent ranging from about 10 ng to about 10 μg, and preferably about 100 ng to about 1 μg, is sufficient to immobilize an adequate amount of binding agent.

Covalent attachment of binding agent to a solid support may generally be achieved by first reacting the support with a bifunctional reagent that will react with both the support and a functional group, such as a hydroxyl or amino group, on the binding agent. For example, the binding agent may be covalently attached to supports having an appropriate polymer coating using benzoquinone or by condensation of an aldehyde group on the support with an amine and an active hydrogen on the binding partner (*see*, *e.g.*, Pierce Immunotechnology Catalog and Handbook, 1991, at A12-A13).

In certain embodiments, the assay is a two-antibody sandwich assay. This assay may be performed by first contacting an antibody that has been immobilized on a solid support, commonly the well of a microtiter plate, with the sample, such that polypeptides within the sample are allowed to bind to the immobilized antibody. Unbound sample is then removed from the immobilized polypeptide-antibody complexes and a detection reagent (preferably a second antibody capable of binding to a different site on the polypeptide) containing a reporter group is added. The amount of detection reagent that remains bound to the solid support is then determined using a method appropriate for the specific reporter group.

More specifically, once the antibody is immobilized on the support as described above, the remaining protein binding sites on the support are typically blocked. Any suitable blocking agent known to those of ordinary skill in the art, such as bovine serum albumin or Tween 20™ (Sigma Chemical Co., St. Louis, MO). The

immobilized antibody is then incubated with the sample, and polypeptide is allowed to bind to the antibody. The sample may be diluted with a suitable diluent, such as phosphate-buffered saline (PBS) prior to incubation. In general, an appropriate contact time (*i.e.*, incubation time) is a period of time that is sufficient to detect the presence of polypeptide within a sample obtained from an individual with lung cancer. Preferably, the contact time is sufficient to achieve a level of binding that is at least about 95% of that achieved at equilibrium between bound and unbound polypeptide. Those of ordinary skill in the art will recognize that the time necessary to achieve equilibrium may be readily determined by assaying the level of binding that occurs over a period of time. At room temperature, an incubation time of about 30 minutes is generally sufficient.

Unbound sample may then be removed by washing the solid support with an appropriate buffer, such as PBS containing 0.1% Tween 20™. The second antibody, which contains a reporter group, may then be added to the solid support. Preferred reporter groups include those groups recited above.

The detection reagent is then incubated with the immobilized antibody-polypeptide complex for an amount of time sufficient to detect the bound polypeptide. An appropriate amount of time may generally be determined by assaying the level of binding that occurs over a period of time. Unbound detection reagent is then removed and bound detection reagent is detected using the reporter group. The method employed for detecting the reporter group depends upon the nature of the reporter group. For radioactive groups, scintillation counting or autoradiographic methods are generally appropriate. Spectroscopic methods may be used to detect dyes, luminescent groups and fluorescent groups. Biotin may be detected using avidin, coupled to a different reporter group (commonly a radioactive or fluorescent group or an enzyme). Enzyme reporter groups may generally be detected by the addition of substrate (generally for a specific period of time), followed by spectroscopic or other analysis of the reaction products.

To determine the presence or absence of a cancer, such as lung cancer, the signal detected from the reporter group that remains bound to the solid support is generally compared to a signal that corresponds to a predetermined cut-off value. In

one preferred embodiment, the cut-off value for the detection of a cancer is the average mean signal obtained when the immobilized antibody is incubated with samples from patients without the cancer. In general, a sample generating a signal that is three standard deviations above the predetermined cut-off value is considered positive for the cancer. In an alternate preferred embodiment, the cut-off value is determined using a Receiver Operator Curve, according to the method of Sackett *et al.*, *Clinical Epidemiology: A Basic Science for Clinical Medicine*, Little Brown and Co., 1985, p. 106-7. Briefly, in this embodiment, the cut-off value may be determined from a plot of pairs of true positive rates (*i.e.*, sensitivity) and false positive rates (100%-specificity) that correspond to each possible cut-off value for the diagnostic test result. The cut-off value on the plot that is the closest to the upper left-hand corner (*i.e.*, the value that encloses the largest area) is the most accurate cut-off value, and a sample generating a signal that is higher than the cut-off value determined by this method may be considered positive. Alternatively, the cut-off value may be shifted to the left along the plot, to minimize the false positive rate, or to the right, to minimize the false negative rate. In general, a sample generating a signal that is higher than the cut-off value determined by this method is considered positive for a cancer.

In a related embodiment, the assay is performed in a flow-through or strip test format, wherein the binding agent is immobilized on a membrane, such as nitrocellulose. In the flow-through test, polypeptides within the sample bind to the immobilized binding agent as the sample passes through the membrane. A second, labeled binding agent then binds to the binding agent-polypeptide complex as a solution containing the second binding agent flows through the membrane. The detection of bound second binding agent may then be performed as described above. In the strip test format, one end of the membrane to which binding agent is bound is immersed in a solution containing the sample. The sample migrates along the membrane through a region containing second binding agent and to the area of immobilized binding agent. Concentration of second binding agent at the area of immobilized antibody indicates the presence of a cancer. Typically, the concentration of second binding agent at that site generates a pattern, such as a line, that can be read visually. The absence of such a pattern indicates a negative result. In general, the amount of binding agent immobilized

on the membrane is selected to generate a visually discernible pattern when the biological sample contains a level of polypeptide that would be sufficient to generate a positive signal in the two-antibody sandwich assay, in the format discussed above. Preferred binding agents for use in such assays are antibodies and antigen-binding fragments thereof. Preferably, the amount of antibody immobilized on the membrane ranges from about 25 ng to about 1 μg, and more preferably from about 50 ng to about 500 ng. Such tests can typically be performed with a very small amount of biological sample.

Of course, numerous other assay protocols exist that are suitable for use with the tumor proteins or binding agents of the present invention. The above descriptions are intended to be exemplary only. For example, it will be apparent to those of ordinary skill in the art that the above protocols may be readily modified to use lung tumor polypeptides to detect antibodies that bind to such polypeptides in a biological sample. The detection of such lung tumor protein specific antibodies may correlate with the presence of a cancer.

A cancer may also, or alternatively, be detected based on the presence of T cells that specifically react with a lung tumor protein in a biological sample. Within certain methods, a biological sample comprising $CD4^+$ and/or $CD8^+$ T cells isolated from a patient is incubated with a lung tumor polypeptide, a polynucleotide encoding such a polypeptide and/or an APC that expresses at least an immunogenic portion of such a polypeptide, and the presence or absence of specific activation of the T cells is detected. Suitable biological samples include, but are not limited to, isolated T cells. For example, T cells may be isolated from a patient by routine techniques (such as by Ficoll/Hypaque density gradient centrifugation of peripheral blood lymphocytes). T cells may be incubated *in vitro* for 2-9 days (typically 4 days) at 37°C with polypeptide (*e.g.*, 5 - 25 μg/ml). It may be desirable to incubate another aliquot of a T cell sample in the absence of lung tumor polypeptide to serve as a control. For $CD4^+$ T cells, activation is preferably detected by evaluating proliferation of the T cells. For $CD8^+$ T cells, activation is preferably detected by evaluating cytolytic activity. A level of proliferation that is at least two fold greater and/or a level of cytolytic activity that is at

least 20% greater than in disease-free patients indicates the presence of a cancer in the patient.

As noted above, a cancer may also, or alternatively, be detected based on the level of mRNA encoding a lung tumor protein in a biological sample. For example, at least two oligonucleotide primers may be employed in a polymerase chain reaction (PCR) based assay to amplify a portion of a lung tumor cDNA derived from a biological sample, wherein at least one of the oligonucleotide primers is specific for (*i.e.*, hybridizes to) a polynucleotide encoding the lung tumor protein. The amplified cDNA is then separated and detected using techniques well known in the art, such as gel electrophoresis. Similarly, oligonucleotide probes that specifically hybridize to a polynucleotide encoding a lung tumor protein may be used in a hybridization assay to detect the presence of polynucleotide encoding the tumor protein in a biological sample.

To permit hybridization under assay conditions, oligonucleotide primers and probes should comprise an oligonucleotide sequence that has at least about 60%, preferably at least about 75% and more preferably at least about 90%, identity to a portion of a polynucleotide encoding a lung tumor protein that is at least 10 nucleotides, and preferably at least 20 nucleotides, in length. Preferably, oligonucleotide primers and/or probes hybridize to a polynucleotide encoding a polypeptide described herein under moderately stringent conditions, as defined above. Oligonucleotide primers and/or probes which may be usefully employed in the diagnostic methods described herein preferably are at least 10-40 nucleotides in length. In a preferred embodiment, the oligonucleotide primers comprise at least 10 contiguous nucleotides, more preferably at least 15 contiguous nucleotides, of a DNA molecule having a sequence recited in SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 or 810-826. Techniques for both PCR based assays and hybridization assays

are well known in the art (*see*, for example, Mullis *et al.*, *Cold Spring Harbor Symp. Quant. Biol.*, *51*:263, 1987; Erlich ed., *PCR Technology*, Stockton Press, NY, 1989).

One preferred assay employs RT-PCR, in which PCR is applied in conjunction with reverse transcription. Typically, RNA is extracted from a biological sample, such as biopsy tissue, and is reverse transcribed to produce cDNA molecules. PCR amplification using at least one specific primer generates a cDNA molecule, which may be separated and visualized using, for example, gel electrophoresis. Amplification may be performed on biological samples taken from a test patient and from an individual who is not afflicted with a cancer. The amplification reaction may be performed on several dilutions of cDNA spanning two orders of magnitude. A two-fold or greater increase in expression in several dilutions of the test patient sample as compared to the same dilutions of the non-cancerous sample is typically considered positive.

In another embodiment, the compositions described herein may be used as markers for the progression of cancer. In this embodiment, assays as described above for the diagnosis of a cancer may be performed over time, and the change in the level of reactive polypeptide(s) or polynucleotide(s) evaluated. For example, the assays may be performed every 24-72 hours for a period of 6 months to 1 year, and thereafter performed as needed. In general, a cancer is progressing in those patients in whom the level of polypeptide or polynucleotide detected increases over time. In contrast, the cancer is not progressing when the level of reactive polypeptide or polynucleotide either remains constant or decreases with time.

Certain *in vivo* diagnostic assays may be performed directly on a tumor. One such assay involves contacting tumor cells with a binding agent. The bound binding agent may then be detected directly or indirectly via a reporter group. Such binding agents may also be used in histological applications. Alternatively, polynucleotide probes may be used within such applications.

As noted above, to improve sensitivity, multiple lung tumor protein markers may be assayed within a given sample. It will be apparent that binding agents specific for different proteins provided herein may be combined within a single assay. Further, multiple primers or probes may be used concurrently. The selection of tumor

protein markers may be based on routine experiments to determine combinations that results in optimal sensitivity. In addition, or alternatively, assays for tumor proteins provided herein may be combined with assays for other known tumor antigens.

DIAGNOSTIC KITS

The present invention further provides kits for use within any of the above diagnostic methods. Such kits typically comprise two or more components necessary for performing a diagnostic assay. Components may be compounds, reagents, containers and/or equipment. For example, one container within a kit may contain a monoclonal antibody or fragment thereof that specifically binds to a lung tumor protein. Such antibodies or fragments may be provided attached to a support material, as described above. One or more additional containers may enclose elements, such as reagents or buffers, to be used in the assay. Such kits may also, or alternatively, contain a detection reagent as described above that contains a reporter group suitable for direct or indirect detection of antibody binding.

Alternatively, a kit may be designed to detect the level of mRNA encoding a lung tumor protein in a biological sample. Such kits generally comprise at least one oligonucleotide probe or primer, as described above, that hybridizes to a polynucleotide encoding a lung tumor protein. Such an oligonucleotide may be used, for example, within a PCR or hybridization assay. Additional components that may be present within such kits include a second oligonucleotide and/or a diagnostic reagent or container to facilitate the detection of a polynucleotide encoding a lung tumor protein.

The following Examples are offered by way of illustration and not by way of limitation.

EXAMPLE 1

IDENTIFICATION AND CHARACTERIZATION OF LUNG TUMOR PROTEIN cDNAS

This Example illustrates the identification of cDNA molecules encoding lung tumor proteins.

A. Isolation of cDNA Sequences from Lung Adenocarcinoma Libraries using Conventional cDNA Library Subtraction

A human lung adenocarcinoma cDNA expression library was constructed from poly A^+ RNA from patient tissues (# 40031486) using a Superscript Plasmid System for cDNA Synthesis and Plasmid Cloning kit (BRL Life Technologies, Gaithersburg, MD) following the manufacturer's protocol. Specifically, lung carcinoma tissues were homogenized with polytron (Kinematica, Switzerland) and total RNA was extracted using Trizol reagent (BRL Life Technologies) as directed by the manufacturer. The poly A^+ RNA was then purified using an oligo dT cellulose column as described in Sambrook et al., *Molecular Cloning: A Laboratory Manual*, Cold Spring Harbor Laboratories, Cold Spring Harbor, NY, 1989. First-strand cDNA was synthesized using the NotI/Oligo-dT18 primer. Double-stranded cDNA was synthesized, ligated with BstXI/EcoRI adaptors (Invitrogen, San Diego, CA) and digested with NotI. Following size fractionation with cDNA size fractionation columns (BRL Life Technologies), the cDNA was ligated into the BstXI/NotI site of pcDNA3.1 (Invitrogen) and transformed into ElectroMax *E. coli* DH10B cells (BRL Life Technologies) by electroporation. A total of 3 x 10^6 independent colonies were generated.

Using the same procedure, a normal human cDNA expression library was prepared from a panel of normal tissue specimens, including lung, liver, pancreas, skin, kidney, brain and resting PBMC.

cDNA library subtraction was performed using the above lung adenocarcinoma and normal tissue cDNA libraries, as described by Hara *et al.* (*Blood*, *84*:189-199, 1994) with some modifications. Specifically, a lung adenocarcinoma-

specific subtracted cDNA library was generated as follows. The normal tissue cDNA library (80 μg) was digested with BamHI and XhoI, followed by a filling-in reaction with DNA polymerase Klenow fragment. After phenol-chloroform extraction and ethanol precipitation, the DNA was dissolved in 133 μl of H_2O, heat-denatured and mixed with 133 μl (133 μg) of Photoprobe biotin (Vector Laboratories, Burlingame, CA). As recommended by the manufacturer, the resulting mixture was irradiated with a 270 W sunlamp on ice for 20 minutes. Additional Photoprobe biotin (67 μl) was added and the biotinylation reaction was repeated. After extraction with butanol five times, the DNA was ethanol-precipitated and dissolved in 23 μl H_2O. The resulting DNA, plus other highly redundant cDNA clones that were frequently recovered in previous lung subtractions formed the driver DNA.

To form the tracer DNA, 10 μg lung adenocarcinoma cDNA library was digested with NotI and SpeI, phenol chloroform extracted and passed through Chroma spin-400 columns (Clontech, Palo Alto, CA). Typically, 5 μg of cDNA was recovered after the sizing column. Following ethanol precipitation, the tracer DNA was dissolved in 5 μl H_2O. Tracer DNA was mixed with 15 μl driver DNA and 20 μl of 2 x hybridization buffer (1.5 M NaCl/10 mM EDTA/50 mM HEPES pH 7.5/0.2% sodium dodecyl sulfate), overlaid with mineral oil, and heat-denatured completely. The sample was immediately transferred into a 68 ^{0}C water bath and incubated for 20 hours (long hybridization [LH]). The reaction mixture was then subjected to a streptavidin treatment followed by phenol/chloroform extraction. This process was repeated three more times. Subtracted DNA was precipitated, dissolved in 12 μl H_2O, mixed with 8 μl driver DNA and 20 μl of 2 x hybridization buffer, and subjected to a hybridization at 68 ^{0}C for 2 hours (short hybridization [SH]). After removal of biotinylated double-stranded DNA, subtracted cDNA was ligated into NotI/SpeI site of chloramphenicol resistant pBCSK$^+$ (Stratagene, La Jolla, CA) and transformed into ElectroMax *E. coli* DH10B cells by electroporation to generate a lung adenocarcinoma specific subtracted cDNA library, referred to as LAT-S1 Similarly, LAT-S2 was generated by including 23 genes that were over-expressed in the tracer as additional drivers.

A second human lung adenocarcinoma cDNA expression library was constructed using adenocarcinoma tissue from a second patient (# 86-66) and used to

prepare a second lung adenocarcinoma-specific subtracted cDNA library (referred to as LAT2-S2), as described above, using the same panel of normal tissues and the additional genes over-expressed in LAT-S1.

A third human metastatic lung adenocarcinoma library was constructed from a pool of two lung pleural effusions with lung and gastric adenocarcinoma origins. The subtracted cDNA library, Mets-sub2 was generated as described above using the same panel of normal tissues. However, the Mets-sub3 subtracted library was constructed by including 51 additional genes as drivers. These 51 genes were recovered in Mets-sub2, representing over-expressed housekeeping genes in the testers. As a result, Mets-sub3 is more complexed and normalized.

A total of 16 cDNA fragments isolated from LAT-S1, 585 cDNA fragments isolated from LAT-S2, 568 cDNA clones from LAT2-S2, 15 cDNA clones from Mets-sub2 and 343 cDNA clones from Mets-sub3, described above, were colony PCR amplified and their mRNA expression levels in lung tumor, normal lung, and various other normal and tumor tissues were determined using microarray technology (Incyte, Palo Alto, CA). Briefly, the PCR amplification products were dotted onto slides in an array format, with each product occupying a unique location in the array. mRNA was extracted from the tissue sample to be tested, reverse transcribed, and fluorescent-labeled cDNA probes were generated. The microarrays were probed with the labeled cDNA probes, the slides scanned and fluorescence intensity was measured. This intensity correlates with the hybridization intensity. Seventy-three non-redundant cDNA clones, of which 42 were found to be unique, showed over-expression in lung tumors, with expression in normal tissues tested (lung, skin, lymph node, colon, liver, pancreas, breast, heart, bone marrow, large intestine, kidney, stomach, brain, small intestine, bladder and salivary gland) being either undetectable, or at significantly lower levels compared to lung adenocarcinoma tumors. These clones were further characterized by DNA sequencing with a Perkin Elmer/Applied Biosystems Division Automated Sequencer Model 373A and/or Model 377 (Foster City, CA).

The sequences were compared to known sequences in the gene bank using the EMBL GenBank databases (release 96). No significant homologies were found to the sequence provided in SEQ ID NO: 67, with no apparent homology to

previously identified expressed sequence tags (ESTs). The sequences of SEQ ID NO: 60, 62, 65, 66, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97 and 98 were found to show some homology to previously identified expressed sequence tags (ESTs). The cDNA sequences of SEQ ID NO: 59, 61, 63, 64, 67, 68, 72, 73, 75, 77, 78, 81-83, 85, 87, 88, 93, 94, 96, 99 and 100 showed homology to previously identified genes. The full-length cDNA sequences for the clones of SEQ ID NO: 96 and 100 are provided in SEQ ID NO: 316 and 318, respectively. The amino acid sequences for the clones of SEQ ID NO: 59, 61, 63, 64, 68, 73, 82, 83, 94, 96 and 100 are provided in SEQ ID NO: 331, 328, 329, 332, 327, 333, 330, 326, 325, 324 and 335, respectively. A predicted amino acid sequence encoded by the sequence of SEQ ID NO: 69 (referred to as L552S) is provided in SEQ ID NO: 786.

Further studies led to the isolation of an extended cDNA sequence, and open reading frame, for L552S (SEQ ID NO: 790). The predicted amino acid sequence encoded by the cDNA sequence of SEQ ID NO: 790 is provided in SEQ ID NO: 791. The determined cDNA sequence of an isoform of L552S is provided in SEQ ID NO: 792, with the corresponding predicted amino acid sequence being provided in SEQ ID NO: 793. Subsequent studies led to the isolation of the full-length cDNA sequence of L552S (SEQ ID NO: 808). The corresponding amino acid sequence is provided in SEQ ID NO: 809. No homologies were found to the protein sequence of L552S. However, nucleotides 533-769 of the full-length cDNA sequence were found to show homology to a previously identified DNA sequence.

Full-length cloning efforts on L552S led to the isolation of three additional cDNA sequences (SEQ ID NO: 810-812) from a metastatic lung adenocarcinoma library. The sequence of SEQ ID NO: 810 was found to show some homology to previously identified human DNA sequences. The sequence of SEQ ID NO: 811 was found to show some homology to a previously identified DNA sequence. The sequence of SEQ ID NO: 812 was found to show some homology to previously identified ESTs.

The gene of SEQ ID NO: 84 (referred to as L551S) was determined by real-time RT-PCR analysis to be over-expressed in 2/9 primary adenocarcinomas and to be expressed at lower levels in 2/2 metastatic adenocarcinomas and 1/2 squamous cell

carcinomas. No expression was observed in normal tissues, with the exception of very low expression in normal stomach. Further studies on L551S led to the isolation of the 5' and 3' cDNA consensus sequences provided in SEQ ID NO: 801 and 802, respectively. The L551S 5' sequence was found to show some homology to the previously identified gene STY8 (cDNA sequence provided in SEQ ID NO: 803; corresponding amino acid sequence provided in SEQ ID NO: 805), which is a mitogen activated protein kinase phosphatase. However, no significant homologies were found to the 3' sequence of L551S. Subsequently, an extended cDNA sequence for L551S was isolated (SEQ ID NO: 804). The corresponding amino acid sequence is provided in SEQ ID NO: 806. Further studies led to the isolation of two independent full-length clones for L551S (referred to as 54298 and 54305). These two clones have five nucleotide differences compared to the STY8 DNA sequence. Two of these differences are single nucleotide polymorphisms which do not effect the encoded amino acid sequences. The other three nucleotide differences are consistent between the two L551S clones but lead to encoded amino acid sequences that are different from the STY8 protein sequence. The determined cDNA sequences for the L551S full-length clones 54305 and 54298 are provided in SEQ ID NO: 825 and 826, respectively, with the amino acid sequence for L551S being provided in SEQ ID NO: 827.

B. Isolation of cDNA Sequences from Lung Adenocarcinoma Libraries using PCR-Based cDNA Library Subtraction

cDNA clones from a PCR-based subtraction library, containing cDNA from a pool of two human lung primary adenocarcinomas subtracted against a pool of nine normal human tissue cDNAs including skin, colon, lung, esophagus, brain, kidney, spleen, pancreas and liver, (Clontech, Palo Alto, CA) were derived and submitted to a first round of PCR amplification. This library (referred to as ALT-1) was subjected to a second round of PCR amplification, following the manufacturer's protocol. The expression levels of 760 cDNA clones in lung tumor, normal lung, and various other normal and tumor tissues, were examined using microarray technology as described above. A total of 118 clones, of which 55 were unique, were found to be over-expressed in lung tumor tissue, with expression in normal tissues tested (lung, skin,

lymph node, colon, liver, pancreas, breast, heart, bone marrow, large intestine, kidney, stomach, brain, small intestine, bladder and salivary gland) being either undetectable, or at significantly lower levels. The sequences were compared to known sequences in the gene bank using the EMBL and GenBank databases (release 96). No significant homologies (including ESTs) were found to the sequence provided in SEQ ID NO: 44. The sequences of SEQ ID NO: 1, 11, 13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43, 45, 46, 51 and 57 were found to show some homology to previously identified expressed sequence tags (ESTs). The cDNA sequences of SEQ ID NO: 2-10, 12, 14, 16-19, 21, 22, 28, 31, 32, 35-38, 40, 42, 44, 47-50, 52-56 and 58 showed homology to previously identified genes. The full-length cDNA sequences for the clones of SEQ ID NO: 18, 22, 31, 35, 36 and 42 are provided in SEQ ID NO: 320, 319, 323, 321, 317, 321 and 322, respectively, with the corresponding amino acid sequences being provided in SEQ ID NO: 337, 336, 340, 338, 334, and 339, respectively.

Further studies led to the isolation of an extended cDNA sequence for the clone of SEQ ID NO: 33 (referred to as L801P). This extended cDNA sequence (provided in SEQ ID NO: 796), was found to contain three potential open reading frames (ORFs). The predicted amino acid sequences encoded by these three ORFs are provided in SEQ ID NO: 797-799, respectively.

In subsequent studies, a full-length cDNA sequence for the clone of SEQ ID NO: 44 (referred to as L844P) was isolated (provided in SEQ ID NO: 800). Comparison of this sequence with those in the public databases revealed that the 470 bases at the 5' end of the sequence show homology to the known gene dihydrodiol dehydrogenase, thus indicating that L844P is a novel transcript of the dihydrodiol dehydrogenase family having 2007 base pairs of previously unidentified 3' untranslated region.

The predicted amino acid sequence encoded by the sequence of SEQ ID NO: 46 (referred to as L840P) is provided in SEQ ID NO: 787. An extended cDNA sequence for L840P, which was determined to include an open reading frame, is provided in SEQ ID NO: 794. The predicted amino acid sequence encoded by the cDNA sequence of SEQ ID NO: 794 is provided in SEQ ID NO: 795. The full-length cDNA sequence for the clone of SEQ ID NO: 54 (referred to as L548S) is provided in

SEQ ID NO: 788, with the corresponding amino acid sequence being provided in SEQ ID NO: 789.

Northern blot analyses of the genes of SEQ ID NO: 25 and 46 (referred to as L839P and L840P, respectively) were remarkably similar. Both genes were expressed in 1/2 lung adenocarcinomas as two bands of 3.6 kb and 1.6 kb. No expression of L839P was observed in normal lung or trachea. No expression of L840P was observed in normal bone marrow, resting or activated PBMC, esophagus, or normal lung. Given the similar expression patterns, L839P and L840P may be derived from the same gene.

Further studies on L773P (SEQ ID NO: 58) resulted in the isolation of the extended consensus cDNA sequence provided in SEQ ID NO: 807.

Additional lung adenocarcinoma cDNA clones were isolated as follows. A cDNA library was prepared from a pool of two lung adenocarcinomas and subtracted against cDNA from a panel of normal tissues including lung, brain, liver, kidney, pancreas, skin, heart and spleen. The subtraction was performed using a PCR-based protocol (Clontech), which was modified to generate larger fragments. Within this protocol, tester and driver double stranded cDNA were separately digested with five restriction enzymes that recognize six-nucleotide restriction sites (MluI, MscI, PvuII, SalI and StuI). This digestion resulted in an average cDNA size of 600 bp, rather than the average size of 300 bp that results from digestion with RsaI according to the Clontech protocol. The ends of the restriction digested tester cDNA were filled in to generate blunt ends for adapter ligation. This modification did not affect the subtraction efficiency. Two tester populations were then created with different adapters, and the driver library remained without adapters. The tester and driver libraries were then hybridized using excess driver cDNA. In the first hybridization step, driver was separately hybridized with each of the two tester cDNA populations. This resulted in populations of (a) unhybridized tester cDNAs, (b) tester cDNAs hybridized to other tester cDNAs, (c) tester cDNAs hybridized to driver cDNAs and (d) unhybridized driver cDNAs. The two separate hybridization reactions were then combined, and rehybridized in the presence of additional denatured driver cDNA. Following this second hybridization, in addition to populations (a) through (d), a fifth population (e)

was generated in which tester cDNA with one adapter hybridized to tester cDNA with the second adapter. Accordingly, the second hybridization step resulted in enrichment of differentially expressed sequences which could be used as templates for PCR amplification with adaptor-specific primers.

The ends were then filled in, and PCR amplification was performed using adaptor-specific primers. Only population (e), which contained tester cDNA that did not hybridize to driver cDNA, was amplified exponentially. A second PCR amplification step was then performed, to reduce background and further enrich differentially expressed sequences.

Fifty-seven cDNA clones were isolated from the subtracted library (referred to as LAP1) and sequenced. The determined cDNA sequences for 16 of these clones are provided in SEQ ID NO: 101-116. The sequences of SEQ ID NO: 101 and 114 showed no significant homologies to previously identified sequences. The sequences of SEQ ID NO: 102-109 and 112 showed some similarity to previously identified sequences, while the sequences of SEQ ID NO: 113, 115 and 116 showed some similarity to previously isolated ESTs.

C. Isolation of cDNA Sequences from Small Cell Lung Carcinoma Libraries using PCR-Based cDNA Library Subtraction

A subtracted cDNA library for small cell lung carcinoma (referred to as SCL1) was prepared using essentially the modified PCR-based subtraction process described above. cDNA from small cell lung carcinoma was subtracted against cDNA from a panel of normal tissues, including normal lung, brain, kidney, liver, pancreas, skin, heart, lymph node and spleen. Both tester and driver poly A+ RNA were initially amplified using SMART PCR cDNA synthesis kit (Clontech, Palo Alto, CA). The tester and driver double stranded cDNA were separately digested with five restriction enzymes (DraI, MscI, PvuII, SmaI, and StuI). These restriction enzymes generated blunt end cuts and the digestion resulted in an average insert size of 600 bp. Digestion with this set of restriction enzymes eliminates the step required to generate blunt ends by filling in of the cDNA ends. These modifications did not affect subtraction efficiency.

Eighty-five clones were isolated and sequenced. The determined cDNA sequences for 31 of these clones are provided in SEQ ID NO: 117-147. The sequences of SEQ ID NO: 122, 124, 126, 127, 130, 131, 133, 136, 139 and 147 showed no significant homologies to previously identified sequences. The sequences of SEQ ID NO: 120, 129, 135, 137, 140, 142, 144 and 145 showed some similarity to previously identified gene sequences, while the sequences of SEQ ID NO: 114, 118, 119, 121, 123, 125, 128, 132, 134, 138, 141, 143 and 147 showed some similarity to previously isolated ESTs.

In further studies, three additional cDNA libraries were generated from poly A+ RNA from a single small cell lung carcinoma sample subtracted against a pool of poly A+ RNA from nine normal tissues (lung, brain, kidney, liver, pancreas, skin, heart pituitary gland and spleen). For the first library (referred to as SCL2), the subtraction was carried out essentially as described above for the LAP1 library, with the exception that the tester and driver were digested with PvuII, StuI, MscI and DraI. The ratio of tester and driver cDNA used was as recommended by Clontech. For the second library (referred to as SCL3), subtraction was performed essentially as for SCL2 except that cDNA for highly redundant clones identified from the SCL2 library was included in the driver cDNA. Construction of the SCL4 library was performed essentially as described for the SCL3 library except that a higher ratio of driver to tester was employed.

Each library was characterized by DNA sequencing and database analyses. The determined cDNA sequence for 35 clones isolated from the SCL2 library are provided in SEQ ID NO: 245-279, with the determined cDNA sequences for 21 clones isolated from the SCL3 library and for 15 clones isolated from the SCL4 library being provided in SEQ ID NO: 280-300 and 301-315, respectively. The sequences of SEQ ID NO: 246, 254, 261, 262, 304, 309 and 311 showed no significant homologies to previously identified sequences. The sequence of SEQ ID NO: 245, 248, 255, 266, 270, 275, 280, 282, 283, 288-290, 292, 295, 301 and 303 showed some homology to previously isolated ESTs, while the sequences of SEQ ID NO: 247, 249-253, 256-260, 263-265, 267-269, 271-274, 276-279, 281, 284-287, 291, 293, 294, 296-300, 302, 305-308, 310 and 312-315 showed some homology to previously identified gene sequences.

D. Isolation of cDNA Sequences from a Neuroendocrine Library using PCR-Based cDNA Library Subtraction

Using the modified PCR-based subtraction process, essentially as described above for the LAP1 subtracted library, a subtracted cDNA library (referred to as MLN1) was derived from a lung neuroendocrine carcinoma that had metastasized to the subcarinal lymph node, by subtraction with a panel of nine normal tissues, including normal lung, brain, kidney, liver, pancreas, skin, heart, lymph node and spleen.

Ninety-one individual clones were isolated and sequenced. The determined cDNA sequences for 58 of these clones are provided in SEQ ID NO: 147-222. The sequences of SEQ ID NO: 150, 151, 154, 157, 158, 159, 160, 163, 174, 175, 178, 186-190, 192, 193, 195-200, 208-210, 212-215 and 220 showed no significant homologies to previously identified sequences. The sequences of SEQ ID NO: 152, 155, 156, 161, 165, 166, 176, 179, 182, 184, 185, 191, 194, 221 and 222 showed some similarity to previously identified gene sequences, while the sequences of SEQ ID NO: 148, 149, 153, 164, 167-173, 177, 180, 181, 183, 201-207, 211 and 216-219 showed some similarity to previously isolated ESTs.

The determined cDNA sequences of an additional 442 clones isolated from the MLN1 library are provided in SEQ ID NO: 341-782.

E. Isolation of cDNA Sequences from a Squamous Cell Lung Carcinoma Library using PCR-Based cDNA Library Subtraction

A subtracted cDNA library for squamous cell lung carcinoma (referred to as SQL1) was prepared, essentially using the modified PCR-based subtraction process described above, except the tester and driver double stranded cDNA were separately digested with four restriction enzymes (DraI, MscI, PvuII and StuI) cDNA from a pool of two squamous cell lung carcinomas was subtracted against cDNA from a pool of 10 normal tissues, including normal lung, brain, kidney, liver, pancreas, skin, heart, spleen, esophagus and trachea.

Seventy-four clones were isolated and sequenced. The determined cDNA sequences for 22 of these clones are provided in SEQ ID NO: 223-244. The sequence of SEQ ID NO: 241 showed no significant homologies to previously

identified sequences. The sequences of SEQ ID NO: 223, 225, 232, 233, 235, 238, 239, 242 and 243 showed some similarity to previously identified gene sequences, while the sequences of SEQ ID NO: 224, 226-231, 234, 236, 237, 240, 241 and 244 showed some similarity to previously isolated ESTs.

The sequences of an additional 12 clones isolated during chracterization of cDNA libraries prepared from lung tumor tissue are provided in SEQ ID NO: 813-824. Comparison of these sequences with those in the GenBank database and the GeneSeq DNA database revealed no significant homologies to previously identified sequences.

EXAMPLE 2

SYNTHESIS OF POLYPEPTIDES

Polypeptides may be synthesized on a Perkin Elmer/Applied Biosystems Division 430A peptide synthesizer using FMOC chemistry with HPTU (O-Benzotriazole-N,N,N',N'-tetramethyluronium hexafluorophosphate) activation. A Gly-Cys-Gly sequence may be attached to the amino terminus of the peptide to provide a method of conjugation, binding to an immobilized surface, or labeling of the peptide. Cleavage of the peptides from the solid support may be carried out using the following cleavage mixture: trifluoroacetic acid:ethanedithiol:thioanisole:water:phenol (40:1:2:2:3). After cleaving for 2 hours, the peptides may be precipitated in cold methyl-t-butyl-ether. The peptide pellets may then be dissolved in water containing 0.1% trifluoroacetic acid (TFA) and lyophilized prior to purification by C18 reverse phase HPLC. A gradient of 0%-60% acetonitrile (containing 0.1% TFA) in water (containing 0.1% TFA) may be used to elute the peptides. Following lyophilization of the pure fractions, the peptides may be characterized using electrospray or other types of mass spectrometry and by amino acid analysis.

EXAMPLE 3

PREPARATION OF ANTIBODIES AGAINST LUNG CANCER ANTIGENS

Polyclonal antibodies against the lung cancer antigen L773P (SEQ ID NO: 783) were prepared as follows.

Rabbits were immunized with recombinant protein expressed in and purified from *E. coli* as described above. For the initial immunization, 400 µg of antigen combined with muramyl dipeptide (MDP) was injected subcutaneously (S.C.). Animals were boosted S.C. 4 weeks later with 200 µg of antigen mixed with incomplete Freund's Adjuvant (IFA). Subsequent boosts of 100 µg of antigen mixed with IFA were injected S.C. as necessary to induce high antibody titer responses. Serum bleeds from immunized rabbits were tested for L773P-specific reactivity using ELISA assays with purified protein and showed strong reactivity to L733P. Polyclonal antibodies against L773P were affinity purified from high titer polyclonal sera using purified protein attached to a solid support.

EXAMPLE 4

PROTEIN EXPRESSION OF LUNG TUMOR-SPECIFIC ANTIGENS

Full-length L773P (amino acids 2-364 of SEQ ID NO: 783), with a 6X His Tag, were subcloned into the pPDM expression vector and transformed into either BL21 CodonPlus or BL21 pLysS host cells using standard techniques. High levels of expression were observed in both cases. Similarly, the N-terminal portion of L773P (amino acids 2-71 of SEQ ID NO: 783; referred to as L773PA), with a 6X His tag were subcloned into the vector pPDM and transformed into BL21 CodonPlus host cells. Low levels of expression were observed by N-terminal sequencing. The sequence of the expressed constructs for L773P and L773PA are provided in SEQ ID NO: 784 and 785, respectively.

From the foregoing it will be appreciated that, although specific embodiments of the invention have been described herein for purposes of illustration, various modifications may be made without deviating from the spirit and scope of the invention. Accordingly, the invention is not limited except as by the appended claims.

CLAIMS

What is claimed:

1. An isolated polypeptide, comprising at least an immunogenic portion of a lung tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(a) sequences recited in SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-826;

(b) sequences that hybridize to a sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-826 under moderately stringent conditions; and

(c) complements of sequences of (a) or (b).

2. An isolated polypeptide according to claim 1, wherein the polypeptide comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-

782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-826 or a complement of any of the foregoing polynucleotide sequences.

3. An isolated polypeptide comprising a sequence recited in any one of SEQ ID NOs: 786, 787, 791, 793, 795, 797-799, 806, 809 and 827.

4. An isolated polynucleotide encoding at least 15 amino acid residues of a lung tumor protein, or a variant thereof that differs in one or more substitutions, deletions, additions and/or insertions such that the ability of the variant to react with antigen-specific antisera is not substantially diminished, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-826, or a complement of any of the foregoing sequences.

5. An isolated polynucleotide encoding a lung tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide comprising a sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-826 or a complement of any of the foregoing sequences.

6. An isolated polynucleotide, comprising a sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-826.

7. An isolated polynucleotide, comprising a sequence that hybridizes to a sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-826 under moderately stringent conditions.

8. An isolated polynucleotide complementary to a polynucleotide according to any one of claims 4-7.

9. An expression vector, comprising a polynucleotide according to any one of claims 4-8.

10. A host cell transformed or transfected with an expression vector according to claim 9.

11. An isolated antibody, or antigen-binding fragment thereof, that specifically binds to a lung tumor protein that comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30,

33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-826 or a complement of any of the foregoing polynucleotide sequences.

12. A fusion protein, comprising at least one polypeptide according to claim 1.

13. A fusion protein according to claim 12, wherein the fusion protein comprises an expression enhancer that increases expression of the fusion protein in a host cell transfected with a polynucleotide encoding the fusion protein.

14. A fusion protein according to claim 12, wherein the fusion protein comprises a T helper epitope that is not present within the polypeptide of claim 1.

15. A fusion protein according to claim 12, wherein the fusion protein comprises an affinity tag.

16. An isolated polynucleotide encoding a fusion protein according to claim 12.

17. A pharmaceutical composition, comprising a physiologically acceptable carrier and at least one component selected from the group consisting of:

(a) a polypeptide according to claim 1;

(b) a polynucleotide according to claim 4;

(c) an antibody according to claim 11;

(d) a fusion protein according to claim 12; and

(e) a polynucleotide according to claim 16.

18. An immunogenic composition comprising an immunostimulant and at least one component selected from the group consisting of:

(a) a polypeptide according to claim 1;

(b) a polynucleotide according to claim 4;

(c) an antibody according to claim 11;

(d) a fusion protein according to claim 12; and

(e) a polynucleotide according to claim 16.

19. An immunogenic composition according to claim 18, wherein the immunostimulant is an adjuvant.

20. An immunogenic composition according to any claim 18, wherein the immunostimulant induces a predominantly Type I response.

21. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a pharmaceutical composition according to claim 17.

22. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an immunogenic composition according to claim 18.

23. A pharmaceutical composition comprising an antigen-presenting cell that expresses a polypeptide according to claim 1, in combination with a pharmaceutically acceptable carrier or excipient.

24. A pharmaceutical composition according to claim 23, wherein the antigen presenting cell is a dendritic cell or a macrophage.

25. An immunogenic composition comprising an antigen-presenting cell that expresses a polypeptide comprising at least an immunogenic portion of a lung tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(a) sequences recited in SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826;

(b) sequences that hybridize to a sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826 under moderately stringent conditions; and

(c) complements of sequences of (i) or (ii);

in combination with an immunostimulant.

26. An immunogenic composition according to claim 25, wherein the immunostimulant is an adjuvant.

27. An immunogenic composition according to claim 25, wherein the immunostimulant induces a predominantly Type I response.

28. An immunogenic composition according to claim 25, wherein the antigen-presenting cell is a dendritic cell.

29. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of an antigen-presenting cell that expresses a polypeptide comprising at least an immunogenic portion of a lung tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(a) sequences recited in SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826;

(b) sequences that hybridize to a sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826 under moderately stringent conditions; and

(c) complements of sequences of (i) or (ii)encoded by a polynucleotide recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826;

and thereby inhibiting the development of a cancer in the patient.

30. A method according to claim 29, wherein the antigen-presenting cell is a dendritic cell.

31. A method according to any one of claims 21, 22 and 29, wherein the cancer is lung cancer.

32. A method for removing tumor cells from a biological sample, comprising contacting a biological sample with T cells that specifically react with a lung tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) polynucleotides recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826; and

(ii) complements of the foregoing polynucleotides;

wherein the step of contacting is performed under conditions and for a time sufficient to permit the removal of cells expressing the antigen from the sample.

33. A method according to claim 32, wherein the biological sample is blood or a fraction thereof.

34. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient a biological sample treated according to the method of claim 32.

35. A method for stimulating and/or expanding T cells specific for a lung tumor protein, comprising contacting T cells with at least one component selected from the group consisting of:

(a) polypeptides comprising at least an immunogenic portion of a lung tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(i) sequences recited in SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826;

(ii) sequences that hybridize to a sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826 under moderately stringent conditions; and

(iii) complements of sequences of (i) or (ii);

(b) polynucleotides encoding a polypeptide of (a); and

(c) antigen presenting cells that express a polypeptide of (a);

under conditions and for a time sufficient to permit the stimulation and/or expansion of T cells.

36. An isolated T cell population, comprising T cells prepared according to the method of claim 35.

37. A method for inhibiting the development of a cancer in a patient, comprising administering to a patient an effective amount of a T cell population according to claim 36.

38. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating $CD4^+$ and/or CD8+ T cells isolated from a patient with at least one component selected from the group consisting of:

(i) polypeptides comprising at least an immunogenic portion of a lung tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(1) sequences recited in SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826;

(2) sequences that hybridize to a sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826 under moderately stringent conditions; and

(3) complements of sequences of (1) or (2);

(ii) polynucleotides encoding a polypeptide of (i); and

(iii) antigen presenting cells that expresses a polypeptide of (i);

such that T cells proliferate; and

(b) administering to the patient an effective amount of the proliferated T cells, and thereby inhibiting the development of a cancer in the patient.

39. A method for inhibiting the development of a cancer in a patient, comprising the steps of:

(a) incubating $CD4^+$ and/or CD8+ T cells isolated from a patient with at least one component selected from the group consisting of:

(i) polypeptides comprising at least an immunogenic portion of a lung tumor protein, or a variant thereof, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence selected from the group consisting of:

(1) sequences recited in SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826;

(2) sequences that hybridize to a sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79. 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826 under moderately stringent conditions; and

(3) complements of sequences of (1) or (2);

(ii) polynucleotides encoding a polypeptide of (i); and

(iii) antigen presenting cells that express a polypeptide of (i);

such that T cells proliferate;

(b) cloning at least one proliferated cell to provide cloned T cells; and

(c) administering to the patient an effective amount of the cloned T cells, and thereby inhibiting the development of a cancer in the patient.

40. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with a binding agent that binds to a lung tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826 or a complement of any of the foregoing polynucleotide sequences;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent; and

(c) comparing the amount of polypeptide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

41. A method according to claim 40, wherein the binding agent is an antibody.

42. A method according to claim 43, wherein the antibody is a monoclonal antibody.

43. A method according to claim 40, wherein the cancer is lung cancer.

44. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient at a first point in time with a binding agent that binds to a lung tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any

one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826 or a complement of any of the foregoing polynucleotide sequences;

(b) detecting in the sample an amount of polypeptide that binds to the binding agent;

(c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

(d) comparing the amount of polypeptide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

45. A method according to claim 44, wherein the binding agent is an antibody.

46. A method according to claim 45, wherein the antibody is a monoclonal antibody.

47. A method according to claim 44, wherein the cancer is a lung cancer.

48. A method for determining the presence or absence of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a lung tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-

178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826 or a complement of any of the foregoing polynucleotide sequences;

(b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide; and

(c) comparing the amount of polynucleotide that hybridizes to the oligonucleotide to a predetermined cut-off value, and therefrom determining the presence or absence of a cancer in the patient.

49. A method according to claim 48, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

50. A method according to claim 48, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

51. A method for monitoring the progression of a cancer in a patient, comprising the steps of:

(a) contacting a biological sample obtained from a patient with an oligonucleotide that hybridizes to a polynucleotide that encodes a lung tumor protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800-804, 807, 808 and 810-826 or a complement of any of the foregoing polynucleotide sequences;

(b) detecting in the sample an amount of a polynucleotide that hybridizes to the oligonucleotide;

(c) repeating steps (a) and (b) using a biological sample obtained from the patient at a subsequent point in time; and

(d) comparing the amount of polynucleotide detected in step (c) to the amount detected in step (b) and therefrom monitoring the progression of the cancer in the patient.

52. A method according to claim 51, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a polymerase chain reaction.

53. A method according to claim 51, wherein the amount of polynucleotide that hybridizes to the oligonucleotide is determined using a hybridization assay.

54. A diagnostic kit, comprising:

(a) one or more antibodies according to claim 11; and

(b) a detection reagent comprising a reporter group.

55. A kit according to claim 54, wherein the antibodies are immobilized on a solid support.

56. A kit according to claim 54, wherein the detection reagent comprises an anti-immunoglobulin, protein G, protein A or lectin.

57. A kit according to claim 54, wherein the reporter group is selected from the group consisting of radioisotopes, fluorescent groups, luminescent groups, enzymes, biotin and dye particles.

58. An oligonucleotide comprising 10 to 40 contiguous nucleotides that hybridize under moderately stringent conditions to a polynucleotide that encodes a lung tumor

protein, wherein the tumor protein comprises an amino acid sequence that is encoded by a polynucleotide sequence recited in any one of SEQ ID NOs: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-826, or a complement of any of the foregoing polynucleotides.

59. A oligonucleotide according to claim 58, wherein the oligonucleotide comprises 10-40 contiguous nucleotides recited in any one of SEQ ID NO: 1, 11-13, 15, 20, 23-27, 29, 30, 33, 34, 39, 41, 43-46, 51, 52, 57, 58, 60, 62, 65-67, 69-71, 74, 76, 79, 80, 84, 86, 89-92, 95, 97, 98, 101, 110, 111, 113-119, 121-128, 130-134, 136, 138, 139, 141, 143, 146-151, 153, 154, 157-160, 162-164, 167-178, 180, 181, 183, 186-190, 192, 193, 195-220, 224, 226-231, 234, 236, 237, 240, 241, 244-246, 248, 254, 255, 261, 262, 266, 270, 275, 280, 282, 283, 288, 289, 290, 292, 295, 301, 303, 304, 309, 311, 341-782, 784, 785, 790, 792, 794, 796, 800, 802, 804, 807, 808 and 811-82.

60. A diagnostic kit, comprising:

(a) an oligonucleotide according to claim 59; and

(b) a diagnostic reagent for use in a polymerase chain reaction or hybridization assay.

SEQUENCE LISTING

<110> Corixa Corporation
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<120> COMPOSITIONS AND METHODS FOR THERAPY AND DIAGNOSIS OF LUNG CANCER

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<140> PCT
<141> 2000-06-29

<160> 827

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<211> 250
<212> DNA
<213> Homo sapien

<400> 27
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ttcttccatt atttttttcct cctaccactg agttttgtaa tgaattcctt gtgtatacaa 180
gcaatacagg tgaatactaa actgttattt ttagcttctt caaaagctat tttagaaagc 240
ttcctggaaa 250

<210> 28
<211> 532
<212> DNA
<213> Homo sapien

<400> 28
cctatatcat tcatttatac agaagctgct tgctgcttag caagttggtg ggtttgattt 60
tccttggttg ctttgcagac ctcccttgag aggattcctt ctggatggag atttctttgt 120
tgctgtctcc cttgccacaa ctctgaccaa gattgcattg cgctatgtag ctttggttca 180
ggagaagaaa aagcaaaatt cttttgttgc tgaggctatg ttgctcatgg ctactatcct 240
gcatttggga aaatcctctc ttcctaagaa gccaattact gatgatgatg tggatcgaat 300
ttccctgtgc ctcaaggtct tgtctgaatg ttcaccttta atgaatgaca ttttcaataa 360
ggaatgcaga cagtcccttt ctcacatgtt atctgctaaa ctagaagaag agaaattatc 420
ccaaaagaaa gaatctgaaa agaggaatgt gacagtacag cctgatgacc ccatttcctt 480
catgcaacta actgctaaga atgaaatgaa ctgcaaggaa gatcagtttc ag 532

<210> 29
<211> 486
<212> DNA
<213> Homo sapien

<400> 29
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ctctctattg tcatgttgct tctttctgca aatatatctt acaagttaga ctttaaacct 120
ttgatctccc acaccaaaag agaaaataat atttatatgg aagtaatttt attttagtgt 180
ttgtgattta ttgtggagag caggbgttta aaaattttag aatttctttt taacaaaatc 240
aaatacattg ttaaggtaac aaagaataat tcactatttc agcatttcaa agcaacatat 300
tctacaactt caaagatatt tgcaaaaata atacaactgt tgaagttcaa atgttatgga 360

aagaaacatt agaagtatga aaagtggtac aaaaacatgt ttctttttat tctcttggat 420
atatatctat atatttagga aaatacatat atgtatgtgt atgtatatat atgtatgaaa 480
atatac 486

<210> 30
<211> 240
<212> DNA
<213> Homo sapien

<400> 30
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aatgtctctt gacccccagtt ccaagttcac cctgttgcct gttcttcctc ccaccttttg 120
gggttctata actgcatccc ccacacatct ttcaccacca ccccatacat accagctctc 180
ctgttgtggg attcaggaca taggaagagt tgctgaaggc acgggtgctt ttgggattcg 240

<210> 31
<211> 233
<212> DNA
<213> Homo sapien

<400> 31
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tgggggaagc catccaagag aagatccaag agaaggctgt gaagcgggag gacctgttca 120
tcgtcagcaa gttgtggccc actttctttg agagacccct tgtgaggaaa gcctttgaga 180
agaccctcaa ggacctgaag ctgagctatc tggacgtcta tcttattcac tgg 233

<210> 32
<211> 233
<212> DNA
<213> Homo sapien

<400> 32
gaggaatgct ggactggagg cccctggagc cagatggcaa gagggtgaca gcttcctttc 60
ctgtgtgtac tctgtccagt tcctttagaa aaaatggatg cccagaggac tcccaacccct 120
ggcttggggt caagaaacag ccagcaagag ttaggggcct tagggcactg ggctgttgtt 180
ccattgaagc cgactctggc cctggcccctt acttgcttct ctagctctct agg 233

<210> 33
<211> 319
<212> DNA
<213> Homo sapien

<400> 33
ctgggcctgg atggtctagg atagccttac tcacttgcct ggcaggtgac aggctgttgg 60
ctggaattgc ttggttctcc tccatgtggc ctctccagta ggctagctca ggcttattca 120
catgatggct tcaggattcc aaagagagtg agagtagaag ctgaaagact tcttgagttc 180
ttggcctgga actgggacta ggacagtgtc acttctgcta agttcttttg gtcagagcaa 240
atcacaaggc tttacccaga ttcaagggat gagaaacaga ctacatgtct tgatgagggg 300
aaccacaaag agcttgtgg 319

<210> 34
<211> 340
<212> DNA
<213> Homo sapien

<400> 34
tacagattta attcatgtta ttaactccct gccttttacc tcctccctcc tcccttggca 60
caactgccag atggatgtgg ctggaagtca gaggacattc tcgtgggttc gtgggcctag 120
ggtacaaatg acctcagcgt gacagcaaac aggacagaga agaccaggct cttactcagg 180
aatccaccag ccaggagaat gacaatgttg aacaccggaa ccctgatgat atctgtcaca 240
tttgtaaggt tgatttcaga gtcaggagtg gagacatcgg cagttgactt gggtggagct 300
tgggtcacag ttctggggct ggtatagagt gggcacaagg 340

<210> 35
<211> 170
<212> DNA
<213> Homo sapien

<400> 35
acatgggtcc ttcactcctc gctgagatgt tgcggcagcc ttttcttcca atgcggttgt 60
ggcaggagaa tccacggatg taatgttttc accttttttcc ctgagggtgc tttctgagga 120
accagycctt aagaggtggg gtcttggatt cctgacccag gcgtccggca 170

<210> 36
<211> 475
<212> DNA
<213> Homo sapien

<400> 36
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ctctctattg kcatgttgct tctttctgca aatatatctt agaagttaga ctttaaacct 120
ttgatctccc acaccaaaag agaaaataat atttatatgg aagtaatttt attttagtgt 180
ttgtgattta ttgtggagag caggtgttta aaaattttag aatttcttta acaaaattct 240
aaagagaaaa taaaaaagaa atcacagtat ttacagagat aacagaatgg cttagccatg 300
caaaacaaat aactttggtt tttccccttt tactttggtt taaatgttga ccaagattca 360
atttttttc ctgccaaata aaacttcaat aaaagtttag aggcaaaata acgtattttc 420
ttttttccc ataatatttt atacagcatc gagtctaaga atattttatg cattt 475

<210> 37
<211> 246
<212> DNA
<213> Homo sapien

<400> 37
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ccaggcagcc aggggctagg acctcatgga tcagcagcaa gtccagcagg ttgtagtcag 120
cgaaggagat ctggtctccc acaatgaagg tcttgcctcc ctggttctgg gacagcaggg 180
tctcaaaagg cttcagttgc ccgggcagtg ccttcacata gtcatccttg cccacctcat 240
agttgg 246

<210> 38
<211> 512
<212> DNA
<213> Homo sapien

<400> 38
gctggaagtg aaatgcagat cagacccatt gtgatgtcac agaaagatgg ggacaggcca 60
aagaaaaaag tgactttcaa ctcttcttcc atcattttta tcatcaccag tgatgaatca 120
ctgtcagttg acgacagcga caaaaccaat gggtccaaag ttgatgtaat ccaagttcgt 180
cctttgtagg aatgaagaat ggcaacgaaa gatggggcct taaattggat gccacttttg 240

gactttcatc ataagaagtg tctggaatac ccgttctatg taatatcaac agaaccttgt 300
ggtccagcag gaaatccgaa ttgcccatat gctcttgggc ctcaggaaga ggttgaacaa 360
aaacaaattc ttttaattca acgggtgctt tacataatga aaaaaccact tgtggcacac 420
gatgggcatc taacatcatc atcttctaat gtgttggaga ttttcatttc aaatatattt 480
tttaaattac tctattttcc aaaacacgta at 512

<210> 39
<211> 370
<212> DNA
<213> Homo sapien

<400> 39
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atgtactcga ctctgtccta tttagccttc ccatacctga cttctaatca cttttcctgg 120
tgccctycca tctccctaac ccccccctcac agggatgcct cctcccaagg ctccagaaac 180
tctgaccctc gcactgctgg agggagccca tgaattgctg gtcaatatcg ctcatcctct 240
akactccatc ctgcgtgtgc ttcttcctac aagagctaga gaggcactga ctgataaata 300
cctgtcacct gccccttttcc cagagggtga aactccaccc actcccactg cagaaatgaa 360
tcttaaatgg 370

<210> 40
<211> 204
<212> DNA
<213> Homo sapien

<400> 40
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ggagcagagc agaccttgtt tttagtggtt ccatgggata aaatgggatt ggaggagcta 120
gaagaattca gggtctggtc caatctgcca gtcttcctga aatatcgaaa atacaccagg 180
gctgctatat cagagccacc ctgg 204

<210> 41
<211> 447
<212> DNA
<213> Homo sapien

<400> 41
caggcagcaa ttcgtaaaga attaaatgag tacaaaagta atgaaatgga ggtacatgca 60
tcaagcaagc acttgacaag attccacagg ccatagagat tttcttctga gaagaatttg 120
tgtttaattt tttgatacca acactgaaca ttcatcaggg aactttcctg aagttcagct 180
caagactacc ctacctgctg tgtttgtgag aagagtagga tcacacacac aggtgcaatc 240
ttgaccacac ttacctgcaa gaggagtaac cagaggacac acttccttcc ttctttggtg 300
tctgaggagt gtgaactgtt ggggtcagtt aagacccaac ataactctat cagaagaaaa 360
ctgttgtttg cctttcaacc ttgttttaca gttctgcagt gtagtggagg acgggcaacg 420
tgcatgtgca ggctcaccac tcccagg 447

<210> 42
<211> 498
<212> DNA
<213> Homo sapien

<400> 42
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attagattct cattgcactg aactatattt atatgcctaa gtatgtagaa gtaaaattat 120
ataccccaaa aggattttat cttgttgtat atattaaatg ttatttctgc atatagggtc 180

ttttatggag aaactgatga tgataagctt aatactcact tgtttagcag catctgaatg 240
cacaaatgct ttatatatct cttctgcttt acagggcaaa agatcagact ctgttttctt 300
atagtcttca caagccagcc agaactcaat attctcctca ctgaattcag actttaggaa 360
acttccaaag acattttgac cagtttggtt ggcaagaagt tttccagag attgagacca 420
ttgcattact tcagcagcag aaagtacatc cttggacttg gaagatttca ttccagattc 480
cagatgtggg atcataga 498

<210> 43
<211> 312
<212> DNA
<213> Homo sapien

<400> 43
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ttcatgacag tgtctgggct gccaaagaag cagtgcccct gtgatcattt caagggcaat 120
gtgaagaaaa caagacacca aaggcaccac agaaagccaa acaagcattc cagagcctgc 180
cagcaatttc tcaaacaatg tcagctaaga agctttgctc tgcctttgta ggagctctga 240
gcgcccactc ttccaattaa acattctcag ccaagaagac agtgagcaca cctaccagac 300
actcttcttc tc 312

<210> 44
<211> 417
<212> DNA
<213> Homo sapien

<400> 44
ctaacacatt tactctccac tattcgtact ctggtagcca tgttaacccc atcagagatt 60
ccttctcaag ccatgtctca gagctgagag gcatcccagc aagttttgca gctcacagtt 120
ttttccgtaa attacttatt ctataaaatt ggagtaggcc ataaactttg gagggcccta 180
gaccaatttt ttggattatt tttcgtcttc tatcattccg ctgatcttag atattctctg 240
cattaaatat taaatatcac ttctaggctg aaaaatcccc ctaaaaatat ttctagctca 300
gatttttcct ccaaattctg caatagaaga tcacaatgtg aactctgcat ctccatgtta 360
aagtctaatg gacattcaca cttagcatgt ctcaaagaaa tctcatgtaa accatgg 417

<210> 45
<211> 494
<212> DNA
<213> Homo sapien

<400> 45
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tggtgcatgt acacgtgtgt gtgtgtatgc gtgtaggagc tcacacttgt gtacacgttt 120
gtgtgcatgc atgtgtgcag gagcttgcac gtttgtggtg ggtacatgta catatgtgag 180
tgatcctgtg tgcaagcccc catgtggaca tggctatgag tgagcgtgga gccaaaagcc 240
aggtaacacg catgcagcag gcccactgtg cgtgtctgag acggtctgtg gcagggactg 300
ggtgtgaatc atgcagcagg cccactgtgc gtgtctgaga cggtctgtgg cagggactgg 360
gtgtgaatca gtgaccgtgt ctctgaccaa catgctgaat tacaaattga taatttatta 420
acctgtgcag caacaaataa gatttttcaa aactcaacaa agtgctcaaa gttgacatta 480
cttgcttcaa agtt 494

<210> 46
<211> 516
<212> DNA
<213> Homo sapien

<400> 46
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cttctattgc taattttgtg acctccaaag ctttacttct cggaacctcc tcctttggcc 120
gtcatttgat cattcaactc tttgtcagtg gcaactcccg ctattttggt gtgttggttt 180
gttactacac agtgagcaca aacatggtgg tccaatacag aggctcttcc tgtcaggtgt 240
caaccagaaa gttcatctaa cactgtgata tttgcatcct tcttgaacag ttgttggctg 300
aagattcatt tgatgaatcg atttttcaaa agagatgatt cttggttctt ccgagcgctc 360
agctctcccg ccgagcttct ttgagacgtc ctcaggtgtc ctttgacgat gcgtcctcca 420
ctttcacaca ctctagcatt ccttcactgg ggtcttcatt gccccacatt gggcagccag 480
gaatgttggg gtgatcagac acaacaccag gtcatg 516

<210> 47
<211> 459
<212> DNA
<213> Homo sapien

<400> 47
ccaattcaga gtggcattct gcatttctgt ggcttccaag tcttagaacc tcaactgaca 60
tatagcattg ggcacactcc agcagacgcc cgaattcaaa tcctggaagg atggaagaaa 120
cgcctggaga atatttggga tgagacacca ctgtattttg ctccaagcag cctctttgac 180
ctaaacttcc aggcaggatt cttaatgaaa aaagaggtac aggatgagga gaaaaacaag 240
aaatttggcc tttctgtggg ccatcacttg ggcaagtcca tcccaactga caaccagatc 300
aaagctagaa aatgagattc cttagcctgg atttccttct aacatgttat caaatctggg 360
tatctttcca ggcttccctg acttgcttta gtttttaaga tttgtgtttt tctttttcca 420
caaggaataa atgagaggga atcgaksaaa aaaaaaaaa 459

<210> 48
<211> 430
<212> DNA
<213> Homo sapien

<400> 48
cctatattca gccacagcct ctgggagtgg tgctgataat cggagcttgg aattacccct 60
tcgttctcac cattcagcca ctgataggag ccatcgctgc aggaaatgct gtgattataa 120
agccttctga actgagtgaa aatacagcca agatcttggc aaagcttctc cctcagtatt 180
tagaccagga tctctatatt gttattaatg gtggtgttga ggaaaccacg gagctcctga 240
agcagcgatt tgaccacatt ttctatacgg gaaacactgc ggttggcaaa attgtcatgg 300
aagctgctgc caagcatctg acccctgtga ctcttgaact gggagggaaa agtccatgtt 360
atattgataa agattgtgac ctggacattg tttgcagacg cataacctgg ggaaaataca 420
tgaattgtgg 430

<210> 49
<211> 288
<212> DNA
<213> Homo sapien

<400> 49
ccatccgaag caagattkca gatggcagtg tgaagagaga agacatattc tacacttcaa 60
agctttggwg caattcccat cgaccagagt tggtccgacc agccttggaa aggtcactga 120
aaaatcttca attggattat gttgacctct accttattca ttttccagtg tctgtaaagc 180
caggtgagga agtgatccca aaagatgaaa atggaaaaat actatttgac acagtggatc 240
tctgtgccac gtgggaggcc rtggagaagt gtaaagatgc aggattgg 288

<210> 50
<211> 411

<212> DNA
<213> Homo sapien

<400> 50
ccagagaatg acattcatgt ccccgtggat cccttgcaga gagtacatgg agccactgcc 60
accagtggtg [illegible] ggtcctttgt catacatggc 120
agcgtaagtg taagcaaact ctcctatgaa cactcgctca aaccagcctt tcagaatggc 180
agggactcca aaccactgca gggggaactg gaatatcaca aggtctgcgg cttccagctt 240
cttttgttca gccacaatat ctgggctcag atggccttct ttataagcca gaacagactc 300
ggcaggatac tgaaagttcg cagggtcctt cagtttacct gtgatgtcct ttctggaaat 360
gatgggattg aagttcatgg catagaggtc cgactccacc acctcccatc c 411

<210> 51
<211> 503
<212> DNA
<213> Homo sapien

<400> 51
gatatcttat gattaaaaac aaattaaatt ttaaaacacc tgaagatata ttagaagaaa 60
ttgtgcaccc tccacaaaac atacaaagtt taaaagtttg gatctttttc tcagcaggta 120
tcagttgtaa ataatgaatt aggggccaaa atgcaaaacg aaaaatgaag cagctacatg 180
tagttagtaa tttctagttt gaactgtaat tgaatattgt ggcttcatat gtattatttt 240
atattgtact tttttcatta ttgatggttt ggactttaat aagagaaatt ccatagtttt 300
taatatccca gaagtgagac aatttgaaca gtgtattcta gaaaacaata cactaactga 360
acagaagtga atgcttatat atattatgat agccttaaac ctttttcctc taatgcctta 420
actgtcaaat aattataacc ttttaaagca taggactata gtcagcatgc tagactgaga 480
ggtaaacact gatgcaatta aga 503

<210> 52
<211> 503
<212> DNA
<213> Homo sapien

<400> 52
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ttgtgcaccc tccacaaaac atacaaagtt taaaagtttg gatctttttc tcagcaggta 120
tcagttgtaa ataatgaatt aggggccaaa atgcaaaacg aaaaatgaag cagctacatg 180
tagttagtaa tttctagttt gaactgtaat tgaatattgt ggcttcatat gtattatttt 240
atattgtact tttttcatta ttgatggttt ggactttaat aagagaaatt ccatagtttt 300
taatatccca gaagtgagac aatttgaaca gtgtattcta gaaaacaata cactaactga 360
acagaagtga atgcttatat atattatgat agccttaaac ctttttcctc taatgcctta 420
actgtcaaat aattataacc ttttaaagca taggactata gtcagcatgc tagactgaga 480
ggtaaacact gatgcaatta aga 503

<210> 53
<211> 531
<212> DNA
<213> Homo sapien

<400> 53
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gaatagtaca tgggaaattc tctttaggcc aggtctagta ttacagkgtg gkgctcaagg 120
ccgcccatca gaacagtgat actctcccaa cagatttcat ccaccccgtc tccactaact 180
tttgccataa aaattcctct gaattgtatc ttcttggaag aagtaaatat ctgttcgact 240
atacaaagaa acagagaaac cactcccatt gcaatcaatc ttcaagagag ggagcaggca 300

agccgtgttc tttctgctga gttttataga ctctgacaag ctgtgaaata aacataaaca 360
gaagacaaaa cagtgccaca aataagcagt agatgaccct gtgacaagac ggcattgcag 420
aacaaagact gacgtttaaa ggggagtcat gcagagtaac atgggaacac aagcctgaca 480
acctggtcag cttccactta ctctagctcc tttgaactct caacactaaa a 531

<210> 54
<211> 450
<212> DNA
<213> Homo sapien

<400> 54
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taaaatgaaa aggcactctc gtgttctcct cactctgtgc actttgctgt tggtgtgaca 120
aggcatttaa agatgtttct ggcattttct ttttatttgt aaggtggtgg taactatggt 180
tattggctag aaatcctgag ttttcaactg tatatatcta tagtttgtaa aaagaacaaa 240
acaaccgaga caaacccttg atgctccttg ctcggcgttg aggctgtggg gaagatgcct 300
tttgggagag gctgtagctc agggcgtgca ctgtgaggct ggacctgttg actctgcagg 360
gggcatccat ttagcttcag gttgtcttgt ttctgtatat agtgacatag cattctgctg 420
ccatcttagc tgtggacaaa ggggggtcag 450

<210> 55
<211> 648
<212> DNA
<213> Homo sapien

<400> 55
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tgtctgcaac caggtggaat gtcatcctta cttcaaccag agaaaactgc tggatttctg 120
caagtcaaaa gacattgttc tggttgccta tagtgctctg ggatcccacc gagaagaacc 180
atgggtggac ccgaactccc cggtgctctt ggaggaccca gtcctttgtg ccttggcaaa 240
aaagcacaag cgaaccccag ccctgattgc cctgcgctac cagctrcagc gtggggttgt 300
ggtcctggcc aagagctaca atgagcagcg catcagacag aacgtgcagg tgtttgaatt 360
ccagttgact tcagaggaga tgaaagccat agatggccta aacagaaatg tgcgatattt 420
gacccttgat atttttgctg gcccccctaa ttatccattt tctgatgaat attaacatgg 480
agggcattgc atgaggtctg ccagaaggcc ctgcgtgtgg atggtgacac agaggatggc 540
tctatgctgg tgactggaca catcgcctct ggttaaatct ctcctgcttg gygayttcag 600
caagctacag caaagcccat tggccggaaa aaatatcaag ggtcaaat 648

<210> 56
<211> 536
<212> DNA
<213> Homo sapien

<400> 56
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aaactataga actcttcatt gtcagcaaag caaagagtca ctgcatcaat gaaagttcaa 120
gaacctcctg tacttaaaca cgattcgcaa cgttctgtta ttttttttgt atgtttagaa 180
tgctgaaatg tttttgaagt taaataaaca gtattacatt tttaaactc ttctctatta 240
taacagtcaa tttctgactc acagcagtga acaaaccccc actccattgt atttggagac 300
tggcctccct ataaatgtgg tagcttcttt tattactcag tggacctgcc cgggcggccg 360
ctcgaagccg aattccagca cactggcggc cgttactagt ggatccgagc tcggtaccaa 420
gcttggccgt aatcatggtc atagctgttt cctgtgtgaa attgttatcc gctcacaatt 480
ccacacaaca tacgagccgg aagcataaag tgtaaagcct ggggtgccta atgagt 536

<210> 57 <211> 391

<212> DNA
<213> Homo sapien

<400> 57
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ctttagtagt agtttaaagt agtaactgct [illegible] 120
aatttgaaga ccagatcatg ggtggtctgc atgtgaatga acaggaatga gccggacagc 180
ctggctgtca ttgctttctt cctccccatt tggacccttc tctgccctta catttttgtt 240
tctccatcta ccaccatcca ccagtctatt tatttgtcta gttggatttc atttcttctg 300
gaaaatttat tgtttattgg catgtgaccc ttgactgatg gcttcattag cattytgttt 360
ttctttttgg atccttaata gaaaactcaa t 391

<210> 58
<211> 455
<212> DNA
<213> Homo sapien

<400> 58
gaagacatgc ttacttcccc ttcaccttcc ttcatgatgt gggaagagtg ctgcaaccca 60
gcccctagcca acgccgcatg agagggagtg tgccgagggc ttctgagaag gtttctctca 120
catctagaaa gaagcgctta agatgtggca gcccctcttc ttcaagtggc tcttgtcctg 180
ttgccctggg agttctcaaa ttgctgcagc agcctccacc cagcctgagg atgacatcaa 240
tacacagagg aagaagagtc aggaaaagat gagagaagtt acagactctc ctgggcgacc 300
ccgagagctt accattcctc agacttcttc acatggtgct aacagatttg ttcctaaaag 360
taaagctcta gaggccgtca aattggcaat agaagccggg ttccaccata ttgattctgc 420
acatgtttac aataatgagg agcaggttgg actgg 455

<210> 59
<211> 398
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(398)
<223> n = A,T,C or G

<400> 59
ctcagaggca gcgtgcgggt gtgctctttg tgaaattcca ccatggcgta ccgtggccag 60
ggtcagaaag tgcagaaggt tatggtgcag cccatcaacc tcatcttcag atacttacaa 120
aatagatcgc ggattcaggt gtggctctat gagcaagtga atatgcggat agaaggctgt 180
atcattggtt ttgatgagta tatgaacctt gtattagatg atgcagaaga gattcattct 240
aaaacaaagt caagaaaaca actngntcgg atcatgctaa aaggagataa tattactctg 300
ctacaaagtg tctccaacta gaaatgatca atgaagtgag aaattgttga gaaggataca 360
gtttgttttt agatgtcctt tgtccaatgt gaacattt 398

<210> 60
<211> 532
<212> DNA
<213> Homo sapien

<400> 60
gacttctgag acctggggca cccgggcctt tgcggcagct actggcaggg cctggccacc 60
tcataggact cagttccctt ctgaacactc gggggacatg ggcctctaac tgcccactct 120
gatatgcctg ggtgagccta ggagggaagg ctctgatttg gatttctcca gtcaaagctc 180

acagaaaaaa acctggcact ttgattttca tgggatggtc ctaacagggt cagtcacctc 240
cgagcagttt gggaacccag tttcttgtcc tgggccctca ggtcagcctg gctgaattag 300
gacccttcct tggcacaggg gtgagaaaga gcttggggaa cgcttggcat tatggagggc 360
tggaaggggc tcaaccccga tttggagaga agtttgggat ggagtgggcg agagattgag 420
agagcgagca ggaaaagagg tcttggagcc tgggactgat ggtggataag gcctggaaag 480
aasatgacsa ggaggaggag agagggaagt gggtggatga ggagcaggct ga 532

<210> 61
<211> 466
<212> DNA
<213> Homo sapien

<400> 61
gcgacggcga cgtctctttt gactaaaaga cagtgtccag tgctccagcc taggagtcta 60
cggggaccgc ctcccgcgcc gccaccatgc ccaacttctc tggcaactgg aaaatcatcc 120
gatcggaaaa cttcgaggaa ttgctcaaag tgctgggggt gaatgtgatg ctgaggaaga 180
ttgctgtggc tgcagcgtcc aagccagcag tggagatcaa acaggaggga gacactttct 240
acatcaaaac ctccaccacc gtgcgcacca cagagattaa cttcaaggtt ggggaggagt 300
ttgaggagca gactgtggat gggaggccct gtaagagcct ggtgaaatgg gagagtgaga 360
ataaaatggt ctgtgagcag aagctcctga agggagaggg ccccaagacc tcgtggacca 420
gagaactgac caacgatggg gaactgatcc tgaccatgac ggcgga 466

<210> 62
<211> 548
<212> DNA
<213> Homo sapien

<400> 62
ttttgaattt acaccaagaa cttctcaata aaagaaaatc atgaatgctc cacaatttca 60
acataccaca agagaagtta atttcttaac attgtgttct atgattattt gtaagacctt 120
caccaagttc tgatatcttt taaagacata gttcaaaatt gcttttgaaa atctgtattc 180
ttgaaaatat ccttgttgtg tattaggttt ttaaatacca gctaaaggat tacctcactg 240
agtcatcagt accctcctat tcagctcccc aagatgatgt gtttttgctt accctaagag 300
aggttttctt cttattttta gataattcaa gtgcttagat aaattatgtt ttctttaagt 360
gtttatggta aactctttta aagaaaattt aatatgttat agctgaatct ttttggtaac 420
tttaaatctt tatcatagac tctgtacata tgttcaaatt agctgcttgc ctgatgtgtg 480
tatcatcggt gggatgacag aacaaacata tttatgatca tgaataatgt gctttgtaaa 540
aagatttc 548

<210> 63
<211> 547
<212> DNA
<213> Homo sapien

<400> 63
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cctatgtaag gccatgtgcc ccttgcccta acaactcact gcagtgctct tcatagacac 120
atcttgcagc atttttctta aggctatgct tcagtttttc tttgtaagcc atcacaagcc 180
atagtggtag gtttgccctt tggtacagaa ggtgagttaa agctggtgga aaaggcttat 240
tgcattgcat tcagagtaac ctgtgtgcat actctagaag agtagggaaa ataatgcttg 300
ttacaattcg acctaatatg tgcattgtaa aataaatgcc atatttcaaa caaaacacgt 360
aatttttta cagtatgttt tattaccttt tgatatctgt tgttgcaatg ttagtgatgt 420
tttaaaatgt gatcgaaaat ataatgcttc taagaaggaa cagtagtgga atgaatgtct 480
aaaagatctt tatgtgttta tggtctgcag aaggattttt gtgatgaaag ggattttttt 540
gaaaaat 547

<210> 64
<211> 528
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(528)
<223> n = A,T,C or G

<400> 64
cacctmctcc csccwggcgc ttwctcsgac gccttgccca scgggccgcc cgaccccctg 60
srccatggac cccgctcgcc csctggggmt gtygatkctg ctgcttttcc tgrckgaggc 120
tgcactgggc gatgctgatc argagccaac aggaaataac rcggagatct gkctcctgcc 180
cctagactac kgaccctgcc kggccctact tytccgytac tactacgaca ggyacacgca 240
gagctgccgc cwgttcctgk rckggggctg crasggcaac rccaacwatt yctacacckg 300
kgaggmttrc gackatgctw gstggargat agaaaaagtt cccaaasttt gccggctgma 360
agtgaatgag gacnaccagg gtgaggggta cacagataag tatttcttta atctaakkwc 420
catgacatgw gaaaaattct ttnncggtgg gngtcaccgg accggattga gaacangttt 480
gcagatgang ctactgggat gggctcctgc rcacnaaaga aantatca 528

<210> 65
<211> 547
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(547)
<223> n = A,T,C or G

<400> 65
kgaatgaasa acgaacgctg gaagtagaaa tagagcctgg ggtgagagac ggcatggagt 60
acccctttat tggagaaggt gagcctcacg tggatgggga gcctggagat ttacggttcc 120
gaatcaaagt tgtcaagcac ccaatatttg aaaggagagg agatgatttg tacacaaatg 180
tgacagtctc attagttgag tcactggttg gctttgagat ggatattact cacttggatg 240
gtcacaaggt acatatttcc cgggataaga tcaccaggcc aggagcgaag ctatggaaga 300
aaggggaagg gctccccaac tttgacaaca acaatatcaa gggctctttg ataatcactt 360
ttgatgtgga ttttccaaaa gaacagttaa cagaggaagc gagagaangt atcaaacagc 420
tactgaaaca agggtcagtg cagaaggtat acaatggact gcaaggatat tgagagtgaa 480
taaaattgga ctttgtttaa aataaagtga ataagcgata tttattatct gcaaggtttt 540
ttttgtg 547

<210> 66
<211> 535
<212> DNA
<213> Homo sapien

<400> 66
ggggaggtct acgcttctag agcttgagcc agcggggcga ccctgcagtg gcaggactcg 60
gcaccgcgcc ctccaccgcc ggttggtggc ctgcgtgaca gtttcctccc gtcgacatcg 120
aaaggaagcc ggacgtgggc gggcagagag cttcatcgca gtaggaatgg cagccccatc 180
tatgaaggaa agacaggtct gctgggggc ccgggatgag tactggaagt gtttagatga 240
gaacttagag gatgcttctc aatgcaagaa gttaagaagc tctttcgaat caagttgtcc 300

ccaacagtgg ataaaatatt ttgataaaag aagagactac ttaaaattca aagaaaaatt 360
tgaagcagga caatttgagc cttcagaaac aactgcaaaa tcctaggctg ttcataaaga 420
ttgaaagtat tctttctgga cattgaaaaa gctccactga ctatggaaca gtaatagttt 480
gaatcatagt gaacatcaat acttgttccc tatatacgac acttgataat taaga 535

<210> 67
<211> 527
<212> DNA
<213> Homo sapien

<400> 67
atttctgcca cttaattcaa acagtcatat gcaggtcgct taatttattt gtgcttttgt 60
ttcatcttct acaaggccct cttagctcta aaacttgaca gtggaataag gaaatgtttt 120
tccaaatctg cattgccggt gagatcctca acatcagcat gttgagatgg acctcaaccc 180
cacctctaac cctgaaacac actactcgat attatcttag gtatgtttta gggtttagtt 240
tgtaaaataa taatttattt ttgaaggaaa tataaaatat taaagagtaa taatagctat 300
catttttttaa gattcaatct aaaacaatgg actctttttt tttccatttg tgatgtagat 360
aagcaagaca attttgatca tgagtggtga aaagaggatc aaacttgact attcttgcaa 420
tggcagtcca gcaacaagcc tttcatttac attaaattat aacttttcat tcattcctaa 480
accaaactta aaattctgct ttcctttgag tagaaggtat ttaactt 527

<210> 68
<211> 431
<212> DNA
<213> Homo sapien

<400> 68
gggaaacttc atgggtttcc tcatctgtca tgtcgatgat tatatatgga tacatttaca 60
aaaataaaaa gcgggaattt tcccttcgct tgaatattat ccctgtatat tgcatgaatg 120
agagatttcc catatttcca tcagagtaat aaatatactt gctttaattc ttaagcataa 180
gtaaacatga tataaaaata tatgctgaat tacttgtgaa gaatgcattt aaagctattt 240
taaatgtgtt tttatttgta agacattact tattaagaaa ttggttatta tgcttactgt 300
tctaatctgg tggtaaaggt attcttaaga atttgcaggt actacagatt ttcaaaactg 360
aatgagagaa aattgtataa ccatcctgct gwtcctttag tgcaatacaa taaaactctg 420
aaattaaaac t 431

<210> 69
<211> 399
<212> DNA
<213> Homo sapien

<400> 69
gacacggcgg acacacacaa acacagaacc acacagccag tcccaggagc ccagtaatgg 60
agagccccaa aaagaagaac cagcagctga aagtcgggat cctacacctg ggcagcagac 120
agaagaagat caggatacag ctgagatccc agtgcgcgac atggaaggtg atctgcaaga 180
gctgcatcag tcaaacaccg gggataaatc tggatttggg ttccggcgtc aaggtgaaga 240
taatacctaa agaggaacac tgtaaaatgc cagaagcagg tgaagagcaa ccacaagttt 300
aaatgaagac aagctgaaac aacgcaagct ggttttatat tagatatttg acttaaacta 360
tctcaataaa gttttgcagc tttcaccaar aaaaaaaaa 399

<210> 70
<211> 479
<212> DNA
<213> Homo sapien

<400> 70
cgcggcggag ctgtgagccg gcgactcggg tccctgaggt ctggattctt tctccgctac 60
tgagacacgg cggacacaca caaacacaga accacacagc cagtcccagg agcccagtaa 120
tggagagccc caaaaagaag aaccagcagc tgaaagtcgg gatcctacac ctgggcagca 180
gacagaagaa gatcaggata cagctgagat cccaggtgct gggaagggaa atgcgcgaca 240
tggaaggtga tctgcaagag ctgcatcagt caaacactgg [illegible] [illegible] 300
tccggcgtca aggtgaagat aatacctaaa gaggaacact gtaaaatgcc agaagcaggt 360
gaagagcaac cacaagttta aatgaagaca agctgaaaca acgcaagctg gttttatatt 420
aggatatttg acttaaacta tctcaataaa gttttgcagc tttcaccaaa aaaaaaaa 479

<210> 71
<211> 437
<212> DNA
<213> Homo sapien

<400> 71
ctcagcggct gccaacagat catgagccat cagctcctct ggggccagct ataggacaac 60
agaactctca ccaaaggacc agacacagtg rgcaccatgg gacagtgtcg gtcagccaac 120
gcagaggatg ctcaggaatt cagtgatgtg gagagggcca ttgagaccct catcaagaac 180
tttcaccagt actccgtgga gggtgggaag gagacgctga ccccttctga gctacgggac 240
ctggtcaccc agcagctgcc ccatctcatg ccgagcaact gtggcctgga agagaaaatt 300
gccaacctgg gcagctgcaa tgactctaaa ctggagttca ggagtttctg ggagctgatt 360
ggagaagcgg ccaagagtgt gaagctggag aggcctgtcc gggggcactg agaactcccct 420
ctggaattct tgggggg 437

<210> 72
<211> 561
<212> DNA
<213> Homo sapien

<400> 72
ggatggtata ctgtaaattc agcatatgga gataccatta tcataccttg ccgacttgac 60
gtacctcaga atctcatgtt tggcaaatgg aaatatgaaa agcccgatgg ctccccagta 120
tttattgcct tcagatcctc tacaaagaaa agtgtgcagt acgacgatgt accagaatac 180
aaagacagat tgaacctctc agaaaactac actttgtcta tcagtaatgc aaggatcagt 240
gatgaaaaga gatttgtgtg catgctagta actgaggaca acgtgtttga ggcacctaca 300
atagtcaagg tgttcaagca accatctaaa cctgaaattg taagcaaagc actgtttctc 360
gaaacagagc agctaaaaaa gttgggtgac tgcatttcag aagacagtta tccagatggc 420
aatatcacat ggtacaggaa tggaaaagtg ctacatcccc ttgaaggagc ggtggtcata 480
atttttaaaa aggaaatgga cccagtgact cagctctata ccatgacttc caccctggag 540
tacaagacaa ccaaggctga c 561

<210> 73
<211> 916
<212> DNA
<213> Homo sapien

<400> 73
ggagaaaata aggtggagtc ctacttgttt aaaaaatatg tatctaagaa tgttctaggg 60
cactctggga acctataaag gcaggtattt cgggccctcc tcttcaggaa tcttcctgaa 120
gacatggccc agtcgaaggc ccaggatggc ttttgctgcg gccccgtggg gtaggaggga 180
cagagagaca gggagagtca gcctccacat tcagaggcat cacaagtaat ggcacaattc 240
ttcggatgac tgcagaaaat agtgttttgt agttcaacaa ctcaagacga agcttatttc 300
tgaggataag ctctttaaag gcaaagcttt attttcatct ctcatctttt gtcctcctta 360
gcacaatgta aaaaagaata gtaatatcag aacaggaagg aggaatggct tgctggggag 420

cccatccagg acactgggag cacatagaga ttcacccatg tttgttgaac ttagagtcat 480
tctcatgctt ttctttataa ttcacacata tatgcagaga agatatgttc ttgttaacat 540
tgtatacaac atagccccaa atatagtaag atctatacta gataatccta gatgaaatgt 600
tagagatgct atatgataca actgtggcca tgactgagga aaggagctca cgcccagaga 660
ctgggctgct ctcccggagg ccaaacccaa gaaggtctgg caaagtcagg ctcagggaga 720
ctctgccctg ctgcagacct cggtgtggac acacgctgca tagagctctc cttgaaaaca 780
gaggggtctc aagacattct gcctacctat tagcttttct ttattttttt aacttttttgg 840
ggggaaaagt atttttgaga agtttgtctt gcaatgtatt tataaatagt aaataaagtt 900
tttaccatta aaaaaa 916

<210> 74
<211> 547
<212> DNA
<213> Homo sapien

<400> 74
agtggcatta acttttagaa tttgggctgg tgagattaat ttttttaat atcccagcta 60
gagatatggc ctttaactga cctaaagagg tgtgttgtga tttaattttt tcccgttcct 120
ttttcttcag taaacccaac aatagtctaa ccttaaaaat tgagttgatg tccttatagg 180
tcactacccc taaataaacc tgaagcaggt gttttctctt ggacatacta aaaaatacct 240
aaaaggaagc ttagatgggc tgtgacacaa aaaattcaat tactgtcatc taatgccagc 300
tgttaaaagt gtggccactg agcatttgat tttataggaa aaaatagtat ttttgagaat 360
aacatagctg tgctattgca catctgttgg aggacatccc agatttgctt atactcagtg 420
cctgtgatat tgagtttaag gatttgaggc aggggtaatt attaaacata ttgcttctat 480
tcttggaaaa atagaagkgt aaaatgttaa taatacaaat gtcactgtga cctcctccac 540
tgagagg 547

<210> 75
<211> 793
<212> DNA
<213> Homo sapien

<400> 75
tgaggaagtt gcaagccaac aaaaaagttc aaggatctag aagacgatta agggaaggtc 60
gttctcagtg aaaatccaaa aaccagaaaa aaatgtttat acaaccctaa gtcaataacc 120
tgaccttaga aaattgtgag agccaagttg acttcaggaa ctgaaacatc agcacaaaga 180
agcaatcatc aaataattct gaacacaaat ttaatatttt tttttctgaa tgagaaacat 240
gagggaaatt gtggagttag cctcctgtgg agttagcctc ctgtggtaaa ggaattgaag 300
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atccattaga gaaaaatcct tgtcaccaga ttcattacaa ttcaaatcga agagttgtga 420
actgttatcc cattgaaaag accgagcctt gtatgtatgt tatggataca taaaatgcac 480
gcaagccatt atctctccat gggaagctaa gttataaaaa taggtgcttg gtgtacaaaa 540
ctttttatat caaaaggctt tgcacatttc tatatgagtg ggtttactgg taaattatgt 600
tattttttac aactaatttt gtactctcag aatgtttgtc atatgcttct tgcaatgcat 660
attttttaat ctcaaacgtt tcaataaaac catttttcag atataaagag aattacttca 720
rattgagtaa ttcagaaaaa ctcaagattt aagttaaaaa gtggtttgga cttgggaaca 780
ggactttata cct 793

<210> 76
<211> 461
<212> DNA
<213> Homo sapien

<400> 76
accttgcact attcccctca gtccatctat cgaggtcttt gcaggaagca tactgggaat 60

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tgaaacgaga gcctaaatga catctaagaa aggcagtgtt caataccagg tattaggtga     120
ggatgggatt ctaaggacat cagtgggagg cagggagcca ccttcagacc tcagcatgga     180
agcttccaag atccagagga agaggcaaca gcactgagag tcataggtag aagaatcatc     240
acagccctgc taaccaggca gctgatgccc ctctcccctg gctccctgtg tccaaatcct     300
acaggggcat ctgttggctg aactcaacct gaagccaaag agaagatgag tggagagagg     360
caacatttat agagctcagg ttcctagggc tggagaggga tctggaggga [illegible]     420
acacctggca taaccaaaaa atgattaaaa aaaaaaaaaa a                          461
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<210> 77
<211> 642 <212> DNA
<213> Homo sapien

<400> 77

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ggttgcacga aacacactgg ggaatggagc aaaacagtct ttgaatatcg aacacgcaag      60
gctgtgagac tacctattgt agatattgca ccctatgaca ttggtggtcc tgatcaagaa     120
tttggtgtgg acgttggccc tgtttgcttt ttataaacca aactctatct gaaatcccaa     180
caaaaaaaat ttaactccat atgtgttcct cttgttctaa tcttgtcaac cagtgcaagt     240
gaccgacaaa attccagtta tttatttcca aaatgtttgg aaacagtata atttgacaaa     300
gaaaaatgat acttctcttt ttttgctgtt ccaccaaata caattcaaat gctttttgtt     360
ttattttttt accaattcca atttcaaaat gtctcaatgg tgctataata aataaacttc     420
aacactcttt atgataacaa aaaaaarawa wattctttga atcctagccc atctgcagag     480
caatgactgt gctcaccagt aaaagataac ctttctttct gaaatagtca aatacgaaat     540
tagaaaagcc ctccctattt taactacctc aactggtcag aaacacagat tgtattctat     600
gagtcccaga agatgaaaaa aattttatac gttgataaaa ct                         642
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<210> 78
<211> 519
<212> DNA
<213> Homo sapien

<400> 78

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gcagaagaag aagcggacct tccgcaagtt cacctaccgc ggcgtggacc tcgaccagct      60
gctggacatg tcctacgagc agctgatgca gctgtacagt gcgcgccagc ggcggcggct     120
gaaccggggc ctgcggcgga agcagcactc cctgctgaag cgcctgcgca aggccaagaa     180
ggaggcgccg cccatggaga agccggaagt ggtgaagacg cacctgcggg acatgatcat     240
cctacccgag atggtgggca gcatggtggg cgtctacaac ggcaagacct tcaaccaggt     300
ggagatcaag cccgagatga tcggccacta cctgggcgag ttctccatca cctacaagcc     360
cgtaaagcat ggccggcccg gcatcggggc cacccactcc tcccgcttca tccctctcaa     420
gtaatggctc agctaataaa aggcgcacat gactccaaaa aaaaaaaaaa aagggcggcc     480
gccaccgcgg gggagctcca cttttgttcc ctttaatga                            519
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<210> 79
<211> 526
<212> DNA
<213> Homo sapien

<400> 79

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gtctggaggc ggtgtcctct ccgccctgtc gggtcctgga tgagtacgag ttatggtcac      60
ggtcacagcc tgatctctta tgtgttcata gccattcgct ctcccatcag aactgtttgt     120
cctgaatgtg ttcctctagt tctagaaaat gaccactaat ttaaaaaact cggttgtgag     180
gtttgcccag aggcacttgt tccagaattt cccctcctgc ttcagccatg tccttgtcac     240
ttggcattct aagctaaagc tttagcttcc caattcgtga tgtgctaggc caagattcgg     300
gagctgttgc cagcctcgtc aaatatggaa gagaaacaac ctgcggtcaa aagggagtga     360
tttgttaagt ggtgcgcgtc tatctcataa ctagatgtac caaccaggga agggccaagg     420
atggaaaggg gtaacttttg tgcttccaaa gtagctaagc agaagtgggg gagcagttta     480
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gccagatgat ctttgattag gcaaacattg agttttaaag aggctg 526

<210> 80
<211> 281
<212> DNA
<213> Homo sapien

<400> 80
gttatattag tgggtagtgt aacattttat ccaggttggg gtgaggggag atggccacag 60
tagcaagtgg tgacactaaa taccattttg aaggctgatg tgtatataca tcattactgt 120
ccgtagcaat gaaggataca gtactgtgtt gtgggtgagt gttgctattg cccagcatta 180
atatttgggt gtgtatgttt gaggctatga aacacgcagg agtgtttttg tgctattaat 240
tttaagagaa agcagctttt tcttaaaatt cactgttgag a 281

<210> 81
<211> 405
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(405)
<223> n = A,T,C or G

<400> 81
gtgggtggga gcgcgtgctg ttgggagttg cttggaggtt ggcggcgcgg ggctgaaggc 60
tagcaaaccg agcgatcatg tcgcacaaac aaatttacta ttcggacaaa tacgacsacg 120
aggagtttga statcgacat gtcatgctgc ccaaggacat akccaasctg gtccctaaaa 180
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gtccattata tgatccatga nccagaacct cdcatcttgc tgttccggcg scccacttac 300
cccaanaaac caamgaaatg aaccttggct actacttttc aatcctcaaa kcttttcaca 360
vhtgacctc cttcctaaca ttctttmtga taaacattta ttaag 405

<210> 82
<211> 547
<212> DNA
<213> Homo sapien

<400> 82
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catttacata atatagaaag atatgcatat atctagaagg tatgtggcat ttatttggat 180
aaaattctca attcagagaa atcatctgat gtttctatag tcactttgcc agctcaaaag 240
aaaacaatac cctatgtagt tgtggaagtt tatgctaata ttgtgtaact gatattaaac 300
ctaaatgttc tgcctaccct gttggtataa agatattttg agcagactgt aaacaagaaa 360
aaaaaaatca tgcattctta gcaaaattgc ctagtatgtt aatttgctca aaatacaatg 420
tttgatttta tgcactttgt cgctattaac atcctttttt tcatgtagat ttcaataatt 480
gagtaatttt agaagcatta ttttaggaat atatagtkgt cacagtaaat atcttgtttt 540
ttctatg 547

<210> 83
<211> 529
<212> DNA
<213> Homo sapien

<400> 83
ctattctaag agatgctctt agtgatcttg cattacactt tctgaataaa atgaagatca 60
tggtgattaa ggatattgaa agagaagaca ttgaattcat ttgtaagaca attggaacca 120
agccagttgc tcatattgac caatttactg ctgacatgct gggttctgct gagttagctg 180
aggaggtcaa tttaaatggt tctggcaaac tgctcaagat tacaggctgt gccagccctg 240
gaaaaacagc tacaattgtt gttcgtggtt ctaacaaact [illegible] [illegible] 300
gctccattca tgatgcccta tgtgttattc gttgtttagt gaagaagagg gctcttattg 360
caggaggtgg tgctccagaa atagagttgg ccctacgatt aactgaatat tcacgaacac 420
tgagtggtat ggaatcctac tgcgttcgtg cttttgcaga tgctatggag gtcattccat 480
ctacactagc tgaaaatgcc cggcctgaat cccatttcta cagtaacag 529

<210> 84
<211> 527
<212> DNA
<213> Homo sapien

<400> 84
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acgaaagaac aatttttaaa aagtccctct tttcaatcaa gccaatgtcc tattttattt 180
ctaaaagttt tgggactcgt gctgttatca agtacaatga aaatggcttt ataaatagct 240
gttttgacat tgtgatagaa ggcttgaata cggaggaaag atgtcgctgg agctagtcct 300
gagttccgac tgtccctgtg gtgggaatcc agtctgggaa agcaggactg ttttagcaaa 360
cgtgtactcg ttctataaaa atggaatctg ttctgcaggt taccgtccct ccccgcccaa 420
gcatcccctc tgtcctgtct ctctgctgct gggacccagg gctttttcag ctgcagaacc 480
cactggactt ccaggaatca aggaaaaagt ggaaatgtcc aactgtg 527

<210> 85
<211> 401
<212> DNA
<213> Homo sapien

<400> 85
cagtgtggtg gaattcccaa gatagaaatg aaaaactctt ttatagagtg ctgacatctg 60
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atagtttggt gtttcggaag ccaagaggtc tctttattac tatccacgat cgagggcata 180
ttgcttcagt tctcaatgca tggccagaag atgtcatcaa ggccattgtg gtgactgatg 240
gagagcgtat tcttggcttg ggagaccttg gctgtaatgg aatgggcatc cctgtgggta 300
aattggctct atatacagct tgcggaggga tgaatcctca agaatgtctg cctgtcattc 360
tggatgtggg aaccgaaaat gaggagttac ttaaagatcc a 401

<210> 86
<211> 547
<212> DNA
<213> Homo sapien

<400> 86
gaagcctctt gtgtttgtgt gcagagaagt atatgatcca ccatgctaat gacacttgcc 60
tttttttcca ccattaaggc tttaagaaca tgtggaataa gtttttagc tgctaatgac 120
aaaacaaatc ctgtaactac ccagccagca agtatatagc acagaacact gtgttacttt 180
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tcatactcca tacactacag ttgctgtcac tgatccctgt tttgctggct tttaagctac 360
ttggtcaaaa atcctgcttc cttaaaacat agagaattaa tgagcatctc aagcttttc 420
ttttcctttt taatgatgcc tgcactatca agagtattct agtgttctct ctttgtttgg 480

catataatca tgcaccaaac tttttatttc tttaaggtgg gagtatattt ttatttccta 540
aatgcca 547

<210> 87
<211> 530
<212> DNA
<213> Homo sapien

<400> 87
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gcaatagaag ccgggttcca ccatattgat tctgcacatg tttacaataa tgaggagcag 180
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tacacttcaa agctttggag caattcccat cgaccagagt tggtccgacc agccttggaa 300
aggtcactga aaaatcttca attggactat gttgacctct atcttattca ttttccagtg 360
tctgtaaagc caggtgagga agtgatccca aaagatgaaa atggaaaaat actatttgac 420
acagtggatc tctgtgccac rtgggaggcc atggagaagt gtaaagatgc aggattggcc 480
aagtccatcg ggtgtccaa cttcaaccac aggctgctgg agatgatcct 530

<210> 88
<211> 529
<212> DNA
<213> Homo sapien

<400> 88
acctgagcta agaaggataa ttgtcttttg gtaactaggt ctacaggttt acatttttct 60
gtgttacact caaggataaa ggcaaaatca attttgtaat ttgtttagaa gccagagttt 120
atcttttcta taagtttaca gccttttttct tatatataca gttattgcca cctttgtgaa 180
catggcaagg gactttttta caatttttat tttattttct agtaccagcc taggaattcg 240
gttagtactc atttgtattc actgtcactt tttctcatgt tctaattata aatgaccaaa 300
atcaagattg ctcaaaaggg taaatgatag ccacagtatt gctccctaaa atatgcataa 360
agtagaaatt cactgccttc ccctcctgtc catgaccttg ggcacaggga agttctggtg 420
tcatagatat cccgttttgt gaggtagagc tgtgcattaa acttgcacat gactggaacg 480
aagtatgagt gcaactcaaa tgtgttgaag atactgcagt catttttgt 529

<210> 89
<211> 547
<212> DNA
<213> Homo sapien

<400> 89
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cacacaaggt tatgattttt ttaattactg gcttctgatt tctttcactt ctgatccttt 120
tcctttttct cagatgtagc tgagtcttga tcattttaag acaacgatgg gtagaatttt 180
gagattaatg ttaattttcc ctttttgtta atttcagtcc cctctcacta tgcttttgtc 240
cagaaggatc aagaattcta ccatcccttg ggtctttgtg tataaacaat gttaaataaa 300
ggtagactca gtctttaaga tattagacag tttttttagt ccatgggatt gtaaatataa 360
acattaactt tcctataaga atattttggc tttgtaatct atagcctcaa attggtattt 420
attatggatt cactagacaa acagctgttt ccttattgtc ttttttcttt agtgtttctg 480
atttgctatc agtagctgtt tttaaagcca tccaaggaaa ataattattt acagtttttg 540
aagtcac 547

<210> 90
<211> 528
<212> DNA

<213> Homo sapien

<400> 90
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tgagcctgcc tccagctggc tggggccacc gtgcggggtg ccaacgggct cagagctgga 120
gttgccgccg ccgcccccac tgctgtgtcc [illegible] 180
ctggatccca ggactccggc tttcgccgag ccgcagcggg atccctgtgc acccggcgca 240
gcctaccctt ggtggtctaa acggatgctg ctgggtgttg cgacccagga cgagatgcct 300
tgtttctttt acaataagtt gttggaggaa tgccattaaa gtgaactccc cacctttgca 360
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acaagagtct gttatgcaag cccgtgtgcc aggatgtgc tgggggcggc cacccgctct 480
ccaggaaagg cacagctgag gcactgtggc tggcttcggc ctcaacat 528

<210> 91
<211> 547
<212> DNA
<213> Homo sapien

<400> 91
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gacatataga actttacaaa catatgtcca aggactctaa attgagactc ttccacatgt 120
acaatctcat catcctgaag cctataatga agaaaaagat ctagaaactg agttgtggag 180
ctgactctaa tcaaatgtga tgattggaat taraccmttt ggscyttgra ccttymtwrg 240
raaaawgrmc cmacctttyt taacmtgrac cwccytmatc tctagaagct gggatggact 300
tactatyctk gttwatattt taaatackga aaggtgctat gcttctgtta ttattccaag 360
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ttcttcctat aaaattcctt aaaaataaag atggtttaat cactaccatt gtgaaaacat 480
aactgttaga cttcccgttt ctgaaagaaa gagcatcgtt ccaatgcttg ttcactgttc 540
ctctgtc 547

<210> 92
<211> 527
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(527)
<223> n = A,T,C or G

<400> 92
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ttggggtaac aggatgggta cctgtcacgg cctgtgcaaa cataacatgt gtcaccacac 120
tgaaggtatg gtggaacaag tggcctcacc aaggtcggac cccaatggac tttttgcctc 180
ttgggagctt atgggtctat gaggacacag tagcctttcc tatcagcaaa ctggagtgga 240
tgttgtatct gggggtggcc ttatgtacct gctactgttc tccccacatt gcccagatgc 300
ctgtataact gggaggcact gkgctctcag tttttgcgaa tgtgatgagc cccctggtgt 360
ttctaccctt ttggcaatga ctatccctgg agncatgtgt caaaactgta aagcacaatt 420
tactgctctt tgcggagcac accgctcatg ctctgaatta cacctgaktg tccctcctcc 480
wgktawtgaa tgaggttgat cnvatcagaa adgtggkgtt ggcmata 527

<210> 93
<211> 531
<212> DNA
<213> Homo sapien

<400> 93
ggtattcata cagccttcct aaaggcaatg ctttccacag gatttaagat accccagaaa 60
ggcatcctga taggcatcca gcaatcattc cggccaagat tccttggtgt ggctgaacaa 120
ttacacaatg aaggtttcaa gctgtttgcc acggaagcca catcagactg gctcaacgcc 180
aacaatgtcc ctgccacccc agtggcatgg ccgtctcaag aaggacagaa tcccagcctc 240
tcttccatca gaaaattgat tagagatggc agcattgacc tagtgattaa ccttcccaac 300
aacaacacta aatttgtcca tgataattat gtgattcgga ggacagctgt tgatagtgga 360
atccctctcc tcactaattt tcaggtgacc aaactttttg ctgaagctgt gcagaaatct 420
cgcaaggtgg actccaagag tcttttccac tacaggcagt acagtgctgg aaaagcagca 480
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<210> 94
<211> 547
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(547)
<223> n = A,T,C or G

<400> 94
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aagaatgttt ccattggaat tgttggtaaa gacttggagt ttacaatcta tgatgatgat 120
gatgtgtctc cattcctgga aggtcttgaa gaaagaccac agagaaaggc acagcctgct 180
caacctgctg atgaacctgc agaaaaggct gatgaaccaa tggaacatta agtgataagc 240
cagtctatat atgtattatc aaatatgtaa gaatacaggc accacatact gatgacaata 300
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agatgtgagt tttttccaag caacctcact gaaacctata taatggaata catttttctt 420
tgaaagggtc tgtataatca ttttctagaa agtatgggta tctatactaa tgtttttata 480
tgaagaacat aggtgtcttt gtggttttaa agacaactgt gaaataaaat tgtttcaccg 540
cctggtn 547

<210> 95
<211> 1265
<212> DNA
<213> Homo sapien

<400> 95
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ctaactggga aagacccagg gagactggga tgggctcatg attctacata cagaactcat 120
ccaagaaagg aggaaaagct gatttttgtg aacgtcgcta cttgtgcctg aactaactct 180
caggcacatt agtcagaaaa tactacctat ggttactccc ccaggttcct aaaagtaaag 240
ctttagaggc caccaaattg gcaattgaag ctggcttccg ccatattgat tctgctcatt 300
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tgaagagaga agacatattc tacacttcaa agctttggtg caattcccat cgaccagagt 420
tggtccgacc agccttggaa aggtcactga aaaatcttca attggattat gttgacctct 480
accttattca ttttccagtg tctgtaaagc caggtgagga agtgatccca aaagatgaaa 540
atggaaaaat actatttgac acagtggatc tctgtgccac gtgggaggcc gtggagaagt 600
gtaaagatgc aggattggcc aagtccatcg ggtgtccaa cttcaaccgc aggcagctgg 660
agatgatcct caacaagcca gggctcaagt acaagcctgt ctgcaaccag gtggaatgtc 720
atccttactt caaccagaga aaactgctgg atttctgcaa gtcaaaagac attgttctgg 780
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tgctcttgga ggacccagtc ctttgtgcct tggcaaaaaa gcacaagcga accccagccc 900

tgattgccct gcgctaccag ctrcagcgtg gggttgtggt cctggccaag agctacaatg 960
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cccctaatta tccattttct gatgaatatt aacatggagg gcattgcatg aggtctgcca 1140
gaaggccctg cgtgtggatg gtgacacaga ggatggctct atgctggtga ctggacacat 1200
cgcctctggt taaatctctc ctgcttggtg atttcagcaa gctacagcaa agcccattgg 1260
ccaga 1265

<210> 96
<211> 568
<212> DNA
<213> Homo sapien

<400> 96
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aaagtgctct agaaattgtc agtggtttac atgaagtggc catgggtgtc tggagcaccc 120
tgaaactgta tcaaagttgt acatatttcc aaacattttt aaaatgaaaa ggcactctcg 180
tgttctcctc actctgtgca ctttgctgtt ggtgtgacaa ggcatttaaa gatgtttctg 240
gcatttttctt tttatttgta aggtggtggt aactatggtt attggctaga aatcctgagt 300
tttcaactgt atatatctat agtttgtaaa aagaacaaaa caaccgagac aaacccttga 360
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gggcgtgcac tgtgaggctg gacctgttga ctctgcaggg ggcatccatt tagcttcagg 480
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gggggtcagc tggcatgaga atattttt 568

<210> 97
<211> 546
<212> DNA
<213> Homo sapien

<400> 97
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gggttgtatc ctgccaggtt gagtggggct cacacgctag ggtgagatgt cagaaagcgc 120
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gttcctgggg gtgtgcatct tcgggaaagg tggtggcggg gcgtccacta ggtttcctgt 240
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ttccacctga agacttgtgt taaagttcta cagcgcgcac tgttaactga acgtcttttt 480
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aactgc 546

<210> 98
<211> 547
<212> DNA
<213> Homo sapien

<400> 98
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aaccaaccta gaatcacata gcaaatgaca gaagccagag gcctcccaag tctctctaac 180
tccaaaccct atgcttactc tactatatca cactaccttg caataggaca aagggaatat 240
gtggtaaact atgttcccag catctaaaag ccaggagtgg ttttcatttt tctttaagaa 300
gatgatagtg tgatttgaaa catatctgaa tttcagaaga ggggactttt aaaaattgcc 360
actcataagg aaagaaagaa ctttttcaca tatttttgaa agaaacgatg gtgagaagat 420

attcttgata atagagatat gctaacattt gctttgggtg ttttgtaggt tagattttt 480
tggtgtgtac tttataggct tgcatattgc ttactttaaa cagctgaagt tctaagtaag 540
agtgttc 547

<210> 99
<211> 122
<212> DNA
<213> Homo sapien

<400> 99
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gcaggcccca cctgccaata gtaataaagc aatgtcactt ttttaaaaca aaaaaaaaaa 120
aa 122

<210> 100
<211> 449
<212> DNA
<213> Homo sapien

<400> 100
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ggggatgtgc taaagcgtga aatcagttgt ccttaatttt tagaaagatt ttggtaacta 120
ggtgtctcag ggctgggttg gggtccaaag tgtaaggacc ccctgccctt agtggagagc 180
tggagcttgg agacattacc ccttcatcag aaggaatttt cggatgtttt cttgggaagc 240
tgttttggtc cttggaagca gtgagagctg ggaagcttct tttggctcta ggtgagttgt 300
catgcgggta agttgaggtt atcttgggat aaagggtctt ctagggcaca aaactcactc 360
taggtttata ttgtatgtag cttatatttt ttactaaggt gtcaccttat aagcatctat 420
aaattgagtt ctttttctta gttgtatgg 449

<210> 101
<211> 131
<212> DNA
<213> Homo sapien

<400> 101
ccatgttctc tcttgactac gcatatgtga gatttgcccc tccgccccgc tcgtgatagc 60
catccagatc ttttacctgg ccctgtcttg gagaatctgt tttcaatctc cactgattgc 120
ccccttgctg g 131

<210> 102
<211> 199
<212> DNA
<213> Homo sapien

<400> 102
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acctggattt tttatgtaca accctgaccg tgaccgtttg ctatattcct ttttctatga 120
aataatgtga atgataataa aacagctttg acttgaaaaa aaaaaaaaaa aaaaaaaaaa 180
aaaaaaaaaa aaaaaaaaa 199

<210> 103
<211> 321
<212> DNA
<213> Homo sapien

<400> 103
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aaatcatttg aacaaaaaaa aatggcactc tgattaaact gcattacagc ctgcaggaca 120
ccttgggcca gcttggtttt actctagatt tcactgtcgt cccaccccca cttctttcac 180
cccacttttt ccttcaccaa catgcaaagt ctttccttcc ctgccaccca gataatatag 240
acagatggga aaggcaggcg cggccttcgt tgtcagtagt tctttgatgc gaaaggggca 300
gcacagtcat ttaaacttga t 321

<210> 104
<211> 309
<212> DNA
<213> Homo sapien

<400> 104
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gcttgttagg atagttaaaa aagctgccta ttggctggag ggagaggctt aggcaaaacc 120
cctattactt tgcaaggggc ccttcaaaag tctctgggct tctatttcaa ccgcgatgat 180
gtggctctgg aaggcgtgag ccactttttc cgggaactgg ccaaggaaaa gcccgagggc 240
tacaaccgtt tcctgaaaat gcaaaaccag cggggcggcc gcgctctttt ccaggacatc 300
aaaaagcca 309

<210> 105
<211> 591
<212> DNA
<213> Homo sapien

<400> 105
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cacttcccca ctcctcaccc ccctgtaaag taacctttct ccaaggttat gcttcaacag 180
gaatagctaa catttattaa attgtggcac gtaagtatct tggatatatt ggctcattga 240
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<210> 106
<211> 450
<212> DNA
<213> Homo sapien

<400> 106
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ccactaaact aattaaggtg ttggcataac ctgtcattga attcaagtgt ccaacaactg 120
tttgcttaaa atatcattag acctaatatt tttttcaaag gcacaaagtt taaacatggg 180
gggggcgggt gttgagaggg gtctgggata cccttaaacc caaaaaagtg atttgttccc 240
ccttgcccag aagggtgact gttccactgg gcctgtcacc acaggacatt ttccatgaca 300
agcactcacc ttcttgggga aggggcatca ggttggcaca ggaaaggccc aagtgagggg 360
ccactctgta cattaatact ttggtgatta atgtttgggg agaggcagga ttctcaccca 420
cctttttgac ttcaaacact ctcactcaag 450

<210> 107
<211> 116

<212> DNA
<213> Homo sapien

<400> 107
tcgacgaaag ttactgtcac tcagttgtaa atccatcagc ttttcacctg ttaaaaattt 60
tgcaaaatat acatgttctc ctcctgtttt caattcttcc atcttttttc ttgagg 116

<210> 108
<211> 291
<212> DNA
<213> Homo sapien

<400> 108
ctgctcgaag ttgtcaaaac ccacgtgcag ggcaatggag agtccgatgg ccgaccacag 60
cgagtagcgt cctcccaccc aatcccagaa ctcgaacatg ttttgagggt caattccaaa 120
ctccttcact ttggttgtgt tagtagacag ggcaacaaag tgcttcgcca ctgcagtagg 180
atccttggcc gcctggagaa accactcctt cgccgtctct gcattcgtga tggtctcctg 240
ggtagtaaag gtcttggagg caatgatgaa cagggaggac tcggggttca g 291

<210> 109
<211> 662
<212> DNA
<213> Homo sapien

<400> 109
gctgtttcca cagtacgcct gcctcacacc ttgcgatgcg ccaacatcac catcattgag 60
caccagaagt gtgagaacgc ctaccccggc aacatcacag acaccatggt gtgtgccagc 120
gtgcaggaag ggggcaagga ctcctgccag ggtgactccg ggggccctct ggtctgtaac 180
cagtctcttc aaggcattat ctcctggggc caggatccgt gtgcgatcac ccgaaagcct 240
ggtgtctaca cgaaagtctg caaatatgtg gactggatcc aggagacgat gaagaacaat 300
tagactggac ccacccacca cagcccatca ccctccattt ccacttggtg tttggttcct 360
gttcactctg ttaataagaa accctaagcc aagaccctct acgaacattc tttgggcctc 420
ctggactaca ggagatgctg tcacttaata atcaacctgg ggttcgaaat cagtgagacc 480
tggattcaaa ttctgccttg aaatattgtg actctgggaa tgacaacacc tggtttgttc 540
tctgttgtat ccccagcccc aaaagacagc tcctggacct tgccccgggg cggcccgctc 600
ggaaaggggg cgaaatttct tcaagaatat ttccatttcc acaaacttgg ggccgggggc 660
cc 662

<210> 110
<211> 323
<212> DNA
<213> Homo sapien

<400> 110
tcctgtgaaa cagcccattt tcctacctac tgtgggttgc tgctcaggag gaacgatata 60
cgccaataca agcaggaaat ctgcagctcc tctgctatgt gcctcagaac actttcaatt 120
tttctggtca atgctctgat taggtatcat acataaaagc cagcatatta gtttaaatct 180
ctaacaaaaa actatatttt ccaaagtcat tatcatttgg gccaattaag tgatcttttc 240
gtgctttgtt gagcttcatc tttagggcat ctcttctttc ttcccattca tgaagttcgg 300
catttccatg tgcaaattta cag 323

<210> 111
<211> 336
<212> DNA
<213> Homo sapien

<400> 111
tccagtgcgc tccagcctta tctaggaaag gaggagtggg tgtagccgtg cagcaagatt 60
ggggcctccc ccatcccagc ttctccacca tcccagcaag tcaggatatc agacagtcct 120
cccctgaccc tcccccttgt agatatcaat tcctaaacag agccaaatac tctatatcta 180
tagtcacagc cctgcacagc atttttcata agttatatag taaatggtcc gcatgatttg 240
tgcttctagt gctctcattt ggaaatgagg caggcttctt ctatgaaatg taaagaaaga 300
aaccactttg tatattttgt aataccacct ctgtgg 336

<210> 112
<211> 218
<212> DNA
<213> Homo sapien

<400> 112
tttttttttt tttttttttt tccagtcagg agtattttta atcactgtct acagagacac 60
ctacatacac acacgggtgg ggaatgaacc caaagttttt aggtgaagtc tctcagggcc 120
caccccgtgc cacagacctt cctcggttgc agagattctg ggcaaagcat ccgtgctctc 180
atgagattat cctggggaga tttagaagaa ttttgtgg 218

<210> 113
<211> 533
<212> DNA
<213> Homo sapien

<400> 113
ctgcaccgac agttgcgatg aaagttctaa tctcttccct cctcctgttg ctgccactaa 60
tgctgatgtc catggtctct agcagcctga atccaggggt cgccagaggc cacagggacc 120
gaggccaggc ttctaggaga tggctccaga aaggcggcca agaatgtgag tgcaaagatt 180
ggttcctgag agccccgaga agaaaattca tgacagtgtc tgggctgcca aagaagcagt 240
gcccctgtga tcatttcaag ggcaatgtga agaaaacaag acaccaaagg caccacagaa 300
agccaaacaa gcatcccaga gcctgccagc aatttctcaa acaatgtcag ctaagaagct 360
ttgctctgcc tttgtaggag ctctgagcgc ccactcttcc aattaaacat tctcagccaa 420
gaagacagtg agcacaccta ccagacactc ttcttctccc acctcactct cccactgtac 480
ccacccctaa atcattccag tgctctcaaa aagcatgttt ttcaagatct aaa 533

<210> 114
<211> 261
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(261)
<223> n = A,T,C or G

<400> 114
ccatatctgc tcggcgctac ttctttcttg gattgatcct gantgatgca ttggcgatgc 60
ctttggagaa ggacatgtga tgtgatggtc ttcacgttcc acatgtactc gggcaaatag 120
ggggacaaac tgaagttaaa caggtcgaaa ctagaggagc tgctgaccct ggagctgacc 180
actttcttgg ggaaaaggac acatgaaggt gctttgcaaa agctgatgag caatctggac 240
accaacatag gacaacaacg t 261

<210> 115
<211> 267

<212> DNA
<213> Homo sapien

<400> 115
cctctcctgt gggttccaga ccctgttcca gcaacaattg ctgggacacc tgggccgact 60
gctccacctc gccaggccct ggccctctcc atctcagccc tgacagccac ccagtgataa 120
acacagcagg cttcctaagc aatgtgacgc accagagggg tggtggtaca cgttcccctt 180
gaagtcatct gaaaattaga gaacagattt gcctcatagc tgaagagaga ccctattcca 240
agcatgaatg gccttgacaa tgttcct 267

<210> 116
<211> 239
<212> DNA
<213> Homo sapien

<400> 116
ctgatgacct ggggtctagt gaaaatgcag ggtcagattc agtgggtctg gggtctgaat 60
ctctaaggcg ctgccaagtg atgctgatgc tcctggcttg tggaccaccc tgtgtatagc 120
aaagctctag actaggaggt ctcaaccttg gctgcacaga attatctggg gagtttttaa 180
atttcccagt gcccaggctg cattcatatc atagtagaga cagggttttg ccatgctgg 239

<210> 117
<211> 168
<212> DNA
<213> Homo sapien

<400> 117
aaaaaacttt tatattgctg catcttccac agttctttgg gtagtctctg aacttaaaat 60
ttgtaggagt tgtagactac ctaaattttt aagttatgga tttgttcata ggttgtaggg 120
gtaggtaaag aaggaaacag acaagaaaat ggcttcttga ggtggcag 168

<210> 118
<211> 150
<212> DNA
<213> Homo sapien

<400> 118
aaaaaaaaga gtttatttag aaagtatcat agtgtaaaca aacaaattgt accactttga 60
ttttcttgga atacaagact cgtgatgcaa agctgaagtg tgtgtacaag actcttgaca 120
gttgtgcttc tctaggaggt tgggtttttt 150

<210> 119
<211> 154
<212> DNA
<213> Homo sapien

<400> 119
aaactgtgtg agatattaac cagccgccct gttataaaat caggaaatcc aaacagcgat 60
ttacaccgat taacaccccc ttttatattt tttcaaatac actgagaaaa taatcaaacg 120
ttttcatctc tcttgtcttt ttttgttttt tcct 154

<210> 120
<211> 314
<212> DNA
<213> Homo sapien

<400> 120
ctgcgtggag tgacgggagg agggaatcac tgtgtgtgcg agagtgcttc agactcaatt 60
tccaaaataa ttttcacccc tctaagcatg taaattcaaa gatggatcct tcatagaaat 120
taaaaaatca atttgagctc atttcgaata cagaacaagt atggcacaga tggaagtcct 180
gccacgtttc ctttaatgat gctgactctt [illegible] 240
ctcagacttt acaggcattt tccgtaattc aatcagtcct gctcccagca caacacagga 300
ggtgattcga gaat 314

<210> 121
<211> 601
<212> DNA
<213> Homo sapien

<400> 121
aaaaaaaacc taattcattg aagtaataac caaataattt tcaatcttga ttcaactgtg 60
atttcaaatct tacaccattt gccccttcta tgaatttatg tataaaattt tttaagagtc 120
agagtttttt tttcttgatt aattggatgt atttcacaga atttccaact gctcacgtta 180
gttttcttcc ttttagagtt gatctctcta atgtattaga tcttcatgcc tttgatagtc 240
tctctggaat aagtttgcag aaaaaacttc agcatgtgcc aggaacacaa cctcaccttg 300
atcagagtat tgtacaatca catttgacgt accaggaaat gcaaaggaag aacatcttaa 360
tatgtttatt cagaatcttc tgtgggaaaa gaatgtgaga aacaaggaca atcactgcat 420
ggaggtcata aggctgaagg gattggtgtc aatcaacgac aaatcacaac aagtgattgt 480
ccagggtgtc catgagctct gtgatctgga ggagactcca gtgagctgga aggatgacac 540
tgagagaaca aatcgattgg tcctcattgg cagaaattta gataaggata tccttaaaca 600
g 601

<210> 122
<211> 486
<212> DNA
<213> Homo sapien

<400> 122
ctgtttctaa ttgcttttgt gactgttacc ttttagttca tgcccccccca aagagctaaa 60
tttcacattt ttacctacaa aattgatttt taattcctgc aaataattta ccattatgag 120
ctacaaggtg ggcaacagcg cctgaggatc taattttatg catattactc ccaagtattt 180
taacacttgt tggagaagca atatctggat caataaaaca ctgtcccatc aaccatttga 240
gtggggagag ggagaagctc ttctgtaagt aagattctgg caagctcttt gaaatgagtc 300
ttctttccca cagattttct ctactctttc aatacaaaca gataggagaa gagggaatag 360
aaacctggag gaacttgaat atttttgttc tagatagaga tacagttatt gaaaaggaaa 420
cctagaaagt agtcacacgt cgcttattta ggccagaagt aattgtactg ggcaaaaatt 480
tcactt 486

<210> 123
<211> 239
<212> DNA
<213> Homo sapien

<400> 123
ctggtgggtc ttttttttcct ctcagagctc aagcctgtag tgcctgatgt catttctttc 60
aagttgccca cagtatctcc acttaaacta ggctagtaac caaaataatg tggaccttct 120
ttaggaaaca gtgtgggaga ataggagtcc agccgtaaga taaactggaa atatttgggc 180
gtcttgtacc tggctacgca ccacctcagt gttgttccta cataaacaag gcccctttt 239

<210> 124

<211> 610
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(610)
<223> n = A,T,C or G

<400> 124
ccanccaagt cnttgatgat cactgacccn cgcgcgcctg ctggaccaag gtggctgcgg 60
ggaaatcgcc acngngcttt cggttttctt ggtgaaggaa tacaccgcgc cgacagcagg 120
ttttcagtca gggtcaggga ctgttgcttg cgcgcgaaaa tcaccggtac gccgaggttc 180
aggccggtca tgatcgccgg tgcaatgccc gaggcttcga tggtgacgat cttggtgatg 240
cccgaatcct tgaacaacgc agcgaattca tcaccgatca gtttcatcag cgccgggtcg 300
atctggtggt tcagaaaggc gtcgaccttg agtacctgat cggaaagcac gatgccttct 360
tcgcgaattt tcttgtgcag tgcttccacg aaagcttcct ctgttggcgc aacacgcgcc 420
gaaagtagat taaaaagtag tcgattctag cgctttaaca tcgcgcgtat atccgccagg 480
gcggtattgc cgcgaacggc tttgacttcg gttggtgtgt cgtcgttgcc ttcccatgcc 540
aggtcatccg gcggcagttc gtcaaggaac cggctggggg cacaatcaat gatctcgccg 600
tactgcttgc 610

<210> 125
<211> 196
<212> DNA
<213> Homo sapien

<400> 125
ctatagggct cgagcggccg cccgggcagg taaaaaatca gcccctaatt tctccatgtt 60
tacacttcaa tctgcaggct tcttaaagtg acagtatcct taacctgcca ccagtgtcca 120
ccctccggcc cccgtcttgt aaaaagggga ggagaattag ccaaacactg taagctttta 180
agaagaacaa agtttt 196

<210> 126
<211> 247
<212> DNA
<213> Homo sapien

<400> 126
aaattagtta aaaaaatgca ttcctcattt gatatagcca cattccaaat gcttaaaagc 60
cgcatgtatc tagtgactac catactggag agtacaaata tagaacttta cccgtcactg 120
cagacagttc tgttggattg tgcagcattg gacaatatat acagtttgcc tgtatatgag 180
aaagagagag agagagagag tgtgtgtgtg tgtgtgtgtg tgaagtgcaa taaggctgac 240
aggcatc 247

<210> 127
<211> 590
<212> DNA
<213> Homo sapien

<400> 127
cctccacggc atggcgcaat tgttgttcag gggccgccag gttgctgccc atgccgatgt 60
agatacgttc cacgtgctta ctcgccagac gcactcgaag cgtcgccagc gctacgtttg 120
cgcttgctgc cactgctgcg gcgacgcttt ttcgggccat cgccggtggc ttcgcctttg 180
ctgctgagct ctttgatcat ctcgcggcgc tggctgtcgt tggcgtcctg gtagtcggtc 240

caccactcgc caaggccgtc ggtctgttcg ccggcgcttt cacgcagcag caggaagtca 300
tagcccggca cggaagcgcg ggttgtccag caacaggtcg gcacgtttgc cgctgcggcg 360
tggcaggcgc tcctgcatgt cccagatttc acggatcggc atggtgaagc gtttcgggat 420
ggcgatgcgc tggcattgct cggcgatcag ctcgtgagca gcttcctgca tggctggaat 480
tgccggcatg ccacggtctt gcaggcgcat gacgcgtttc gaaagcgcgg gccacaacag 540
ggcggcaaag aggaacgccg gggtgaccgg tttgttctgc ctgatgcgca 590

<210> 128
<211> 361
<212> DNA
<213> Homo sapien

<400> 128
ctgcccatgg aaaccctcca ggagctgctg gacctgcaca ggaccagtga gagggaggcc 60
attgaagtct tcatgaaaaa ctctttcaag gatgtaacca aagtttccag aaagaattgg 120
agactctact agatgcaaaa cagaatgaca tttgtaaacg gaacctggaa gcatcctcgg 180
attattgctc ggctttactt aaggatattt ttggtcccct agaagaagca gtgaagcagg 240
gaatttattc taagccagga ggccataatc tcttcattca gaaaacagaa gaactgaagg 300
caaagtacta tcgggagcct cggaaaggaa tacaggctga agaagttctg cagaaatatt 360
t 361

<210> 129
<211> 546
<212> DNA
<213> Homo sapien

<400> 129
aaaaatacaa attcagtaag acttttgctc taacaacaat ttttcaaaac gaatcaacaa 60
caaaaaagta tccagtgttt cttttcttat gaagatataa taaaacacag tattggtaag 120
cacattttaa cagtatgctt ttcttttgta gggaaaggag atatggctat gtctaacatc 180
gtgggatcca atgtgtttga tatgttgtgc cttggtattc catggtttat taaaactgca 240
tttataaatg gatcagctcc tgcagaagta aacagcagag gactaactta cataaccatc 300
tctctcaaca tttcaattat ttttcttttt ttagcagttc acttcaatgg ctggaaacta 360
gacagaaagt tgggaatagt ctgcctatta tcatacttgg ggcttgctac attatcagtt 420
ctatatgaac ttggaattat tggaaataat aaaataaggg gctgtggagg ttgatattat 480
taatagtgtt atgcagaaaa tatgaatggc agggaggggc agagagaaaa atccatttct 540
tcattt 546

<210> 130
<211> 733
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(733)
<223> n = A,T,C or G

<400> 130
ggggcctctt cctaaaggca ctaatcccat ccaatagggc ttaacctcat gacttaatca 60
actttcaaag acaccacatc ctaatgccat cacatcagaa tttaggcttc aacatatgaa 120
ttttgggggg acacaaacat tcacctcata gcattcattg tttcttgtta ttggcaaagc 180
caagactcac attgtctaag ttatttgact tttgagtccg cagatgtgaa aacagtgcta 240
aacagtccag cttcatgagt ggagaacagc atttgtgaca accaccaaag tacctctgtg 300
gtcagtgtcc tcaaccaggg cacagcatca tggaccagag cctctgcagg gcacagagga 360

gtggtgagga acaggggctc tggagcaacc ccacttccct ctgctttgta tatggggggt 420
tctgcacatg actgcatttg aaaagggctt cactgcgctt gctgaaggag tgcacttgag 480
ctagcggaga gttcccagag ggtgtctgga agaagcaaag gctattcttt gtttcactca 540
gttatagatg gaagtcagac acttctgcct gaagtacttt cacacactcc acagtcttaa 600
gaaggatgga naaagcatgc caactactca naaaaccaca ggtgttcaag caatggtatc 660
cttttatncc tacaactagt ggacaaagng gggcctctgt aatttgggaa agctaggaaa 720
actttttctg ggg 733

<210> 131
<211> 305
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(305)
<223> n = A,T,C or G

<400> 131
aaacacatac gaatanttna actgtgatta tgaagtgaca gccggctaaa tatgtcttgt 60
attttctctc ttcctttttt tgctaactca tcctttattc cattcctgct tccatggtaa 120
tgcaggctca aataaattac taggatacaa gattacttca agcctctttt ctgtggaact 180
cataatatga taagcatttg ttacaagatt gcctgtagtt gtttagggga caaattatat 240
tagggaaaga aagtctttct ttagttggtt aaattttcta ttataattgg gtactaaatt 300
tattt 305

<210> 132
<211> 545
<212> DNA
<213> Homo sapien

<400> 132
aaacaatgct acactcattt ttggcaaagt gctgtattgt tcagtctgtg tacaaaactg 60
accatctatg aaccaatcag tataaaaaat ttctataaaa acaaaattta gacagcggct 120
caagaaaaca agctgccatt tatgcataga ttgatgtaca gtaacctaac caaatgtccc 180
ttttgaattt tcaagttact gaaaaaaaat gtgtcgagaa acacattaag aaggcacatg 240
tacagtctac aatactcttc agtctcccta actcatgccc tgcccctata aaggaaatat 300
gttcacaatt ttacttgaga aaaaaaaaca aagccactta aaaaaaaaaa aacacacacg 360
caattattaa agttcaaaat ctctggagga aaatacaagc aaaaccactc atacactcca 420
agcctgaaac acacatctaa cctccccagg tactggtttg gttttcagag gtccacctag 480
aaaacaaatc taaaacttca ggcaaaacag agcaaaactg gacatttaac aattacacaa 540
ttttt 545

<210> 133
<211> 330
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(330)
<223> n = A,T,C or G

<400> 133
aatatttatt actaatatct tataatgttt tgtggnacca tggcatacct tgggtactat 60

tgtaacanat agttcaggaa accctactat aaggtttatc aaatggtctc ataaacagtt 120
acttattcaa gcacgccaaa gctcagtgaa aagtattttt caccccttact ctttctcgtg 180
tcattcaaag agaagttttg atgtagtgta tttatttgta gggagtaatg aacagatcca 240
tttcacagta gactttgtgc tctaggtgat gcagctaatt gccccagttt ggaaaacatg 300
gacttggatg aattgtcttt tgtttgggac 330

<210> 134
<211> 627
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(627)
<223> n = A,T,C or G

<400> 134
aaatattact tcaaatacat tttaaagctc aacaaacttg tgttgaactg aattgcagat 60
cctgaactct atttgaaaat acatcatgaa acagaaaanc ccattccaaa tgaaaatgat 120
agtgctttgt tgggggtggg aatgaggcgg ggagactaaa tcactattaa cagacttctt 180
ttcccaatgc aatttgtcaa aagttcaaaa gttctgaaat gtactaaatc ttaagcaaat 240
taaattcatg atattactaa aactttttaa atagtgcaat gacttatcaa gttatagtgg 300
ctgcattaag aacaaattat tgtgtgaaat acctgtataa acacaaaata caattaaata 360
tttctttaca aaaagctgag cattacgcat aatagtggaa tgtctttcat taggtgtatt 420
ttttaaagat taacaaaagt aacatttcct aaaatgtata catgtgccat atttttgcaa 480
acatgcctga gaatgtattt aaaacatttc tgtagtaaga gtttgcaaga acttcacaaa 540
cctgcaaata aaatgcatct ttttaaaaag gtgaaaatgg catctccaca ctgcaacaat 600
tcaaaaagtg cagcatccct aatcttt 627

<210> 135
<211> 277
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(277)
<223> n = A,T,C or G

<400> 135
aaaatcaaat atattatttg ttaaaaatca gcttgtttca ttacnggaaa ttacaccagt 60
ccgttctatt tactttcaaa ccatattcaa ctcctcaact ttcaaacatg taatcaacta 120
atttcaaaag ggaaaaggta ccctttataa aggagagatc tgttaagaca ccaagaaatc 180
aaaattaata tcacttaata attaagtgga taacacatgc ctcccaatac agtgcagtga 240
gaaacacaaa acatcaattc ccgcgtactc tgcgttg 277

<210> 136
<211> 486
<212> DNA
<213> Homo sapien

<400> 136
aaaacagaat gaattcattg ttacagttac agaagtcaga agcccaaata cagtctgcct 60
gaaccaaagc cagggtcagc aaggttcctt tccactgttt tgccaacttc tagaggccac 120
ctgtattcct tggttcatgg cccctctctt catcatcaaa taatcagcat agctttatga 180

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cattggcagc tctgattttg ctcttttgcc ttcctcttat gtagaccctt gtaattacat      240
tgggtacacc cagataaccc caaataatct ccctatctca agattcttaa tgtaattata      300
ttgggaaagt cccttttgtc atataagata acatagcaat ggattccaag gattagtatg      360
tgagtttctt ttgaggggct ataattaacc ctaccacaat atggaaatgt ctattgtttt      420
tctatgtacc agaaataaga cattaggatg tgaaattaat aacataacac cacttacggc      480
atcacc                                                                 486

      <210> 137
      <211> 552
      <212> DNA
      <213> Homo sapien

      <220>
      <221> misc_feature
      <222> (1)...(552)
      <223> n = A,T,C or G

      <400> 137
ccatcttgca tcaaatgttc ttaaggcagt gactggctat caaccacagt ttctgtctcc       60
ccagttgcaa acacaggatc catgcaacag ttctgagacc atacacttag aaaccacagg      120
ggatgcggat caaatgcaga actcccaaat tataaaacag tcaggctaca ctcaaaacaa      180
aacatagaac atcaacaaca cacatctccc aaaaaagaag tgcaacgcat gcttgtataa      240
accaacaata acaaaaaaac cacaataaaa aatgcagagt ctcccaaaca agttttcaaa      300
tgtattgcan aaagaaaaaa aatgtatata tatataaaat taaaaagtct gaaatactag      360
tgcatagtca attacctaac accaagtttc ttttctttct gtccaagctc tactgcccct      420
ctgatactag cagcatgtct acaggctaag accatagcag caaaaaacgt tttcatttg       480
gcatttacaa aattaaatta ctgaataaaa atataatttt ttataaaact atttcttaca      540
gtaataattt tt                                                          552

      <210> 138
      <211> 231
      <212> DNA
      <213> Homo sapien

      <400> 138
aaattttact agtgttactt aatgtatatt ctaaaaagag aatgcagtaa ctaatgccct       60
aaatgtttga tctctgtttg tcattacttt ttcaaaatat ttttttctgt aaagtataat      120
atataaaact tcttgcttaa attgaatttc tatattagtg gttaattgca gtttattaaa      180
gggatcatta tcagtaattt catagcaact gttctagtgt tttgtgtttt t               231

      <210> 139
      <211> 535
      <212> DNA
      <213> Homo sapien

      <400> 139
cagttgccaa ccctctgaac cgtttaggcc ggttcatcgc tgcctttgaa tctgggccgg       60
tggtgatccg gcaaggggtg aaaccaaaga gcgggggctg tgaggcccctt cgcagtccct     120
cgtaagtcgc tgcgatggag tgaactatca cgcatcgtgt ttatttcgtc aacacgaaat      180
gtgatttatt tttgcgaatt aacacggcag ttctcggtta cgttttcgga aagcgtggga      240
tatgattctg tctatcctgt acggatatac agtaattacc gggaggggat tccatggcga      300
agaagcaggc ggcaccggca gcacggcagg aaatgagcgg tatggcgcgc ctcgggcttc      360
gcgtctcatc gatgattaat cacccggtcg cccagacgca gcgctgggtt acgattcatc      420
gcctggacac ggatggggat cgggagtggg aagaggttct gagcgtgatc gctgataccg      480
acgagctcga gctgacgctc aatgacgatg gcagtgtgac ggtgaggtgg gagca           535
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<210> 140
<211> 640
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(640)
<223> n = A,T,C or G

<400> 140
acattggtgg cacttgaact gagtgcaaac cacaacattc ttcagattgt ggatgtgtgt 60
catgacgtag aaaaggatga aaaacttatt cgtctaatgg aagagatcat gagtgagaag 120
gagaataaaa ccattgtttt tgtggaaacc aaaagaagat gtgatgagct taccagaaaa 180
atgaggagag atgggtggcc tgccatgggt atccatggtg acaagagtca acaagagcgt 240
gactgggttc taaatgaatt caaacatgga aaagctccta ttctgattgc tacagatgtg 300
gcctccagag ggctaggtta gtacaaactc gcattcatgg cttggtttcc cagaagatct 360
ccatttaact tttttaaaga aagtttattg ctttctttaa cctgcatttt ttctaagttt 420
tttttcgcat aaaggtgctg tctttgtggc aaggcctagg catgacaatc ggaggactcg 480
agggggatgg aggactagtg atccggctgg ctgcttccag tcgattagag aggtgaaaaa 540
gctgaacgtg tgcccantna atcttcaaaa aggcagaaac atatcacctt ntgccccent 600
aaacttgttc tttttccgaa ggggaaaaaa aaaatggaaa 640

<210> 141
<211> 127
<212> DNA
<213> Homo sapien

<400> 141
aaaaatcaca cactgacaac acagaaatac gaaatgctag gaaaagtcta gcatatgaag 60
gaaaaacatg tcttatgcac tctaatataa tttttcaat tagtataaag gcaaatgcgg 120
ttttttt 127

<210> 142
<211> 126
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(126)
<223> n = A,T,C or G

<400> 142
aaatatcctc tggatgcntt caagtaatac taatcatttc atgngnaaaa gtcttttaat 60
aaacaaattc agagtaaaat taattgaaat atttataata catttgttac acagttattt 120
ccaata 126

<210> 143
<211> 730
<212> DNA
<213> Homo sapien

<220>

<221> misc_feature
<222> (1)...(730)
<223> n = A,T,C or G

<400> 143
gcaagttctg gagtgttcac ttctgagcct gaattccctc ccctgcaaaa tgggggaata 60
ccctcctcag agggtccctg cgagggtgag gggagatcag catggcaggt gtgctgggca 120
cggcagggcc tgggaagggc agatcctttc cccatccctg ccacaaacaa cccaaacctt 180
taaaggagag caatggcctt gtgtcaaaaa caaaaacaaa acaaaaccct gtcctaggag 240
actggggccc taatttctaa tagcaagcct ttatgagtcc ctaacactct actgggctga 300
gtatctcaca cgccagagga taacctgcct tctgctcacc accaccccgt agtagttgtc 360
attgtgtcca tttcacagat gaggcaaagg ctcagaagag tcatgtgtta aaccagcttc 420
tagagcccat gcaggagctg caggtgggga gaatcacctc taggtgctct tcccatggaa 480
tcctcacccct ccttgagtgg tcactcactc anctttccaa tgggtgtgtg acctttgacc 540
agctttcttt ccttntctgg gcctcagttt cccaccttgg acaaagtaag aggtctcttg 600
ggnttcangg tagttcttcc taacttcttt tcctttcat ttgagcatcc ttcttcattt 660
tttgccacct ctcttgtcat tacangcttt taccttcggc cgcgaaccac gcttaagggc 720
naaatttcca 730

<210> 144
<211> 485
<212> DNA
<213> Homo sapien

<400> 144
ctggtcagaa atgattctct tgtgacacca tcgccacaac aggctcgggt ctgtcctccc 60
catatgttac ctgaagatgg agctaccttt cctctgtgtg gcatttgtc gcttatccag 120
tcttctactc gtagggcata ccagcagatc ttggatgtgc tggatgaaaa tcacctgtgt 180
tgcgtggtgg gtctgctgcc gccacttcta atcctcatca tgacaacgtc aggtatggca 240
tttcaaatat agatacaacc attgaaggaa cgtcagatga cctgactgtt gtagatgcag 300
cttcactaag acgacagata atcaaactaa atagacgtct gcaacttctg gaagaggaga 360
acaaagaacg tgctaaaaga gaaatggtca tgtattcaat tactgtagct ttctggctgc 420
ttaatagctg gctctggttt cgccgctaga ggtaacatca gccctcaaaa atattgtctc 480
aacag 485

<210> 145
<211> 465
<212> DNA
<213> Homo sapien

<400> 145
ccaagacagc tcgtttctgg agagtatgag ggtgtgtttt cttattgtga aaggaactac 60
cttctcttag agggtaggaa gaatgtggtg tgtgtgtgtc tcataaagca accggacatt 120
ataggtgccc aggtcatcta taaaaacgat ccttgggctg tgtaaaaatg aagtggcttt 180
tcagtatcct ctttcacact tgctgcttcg ggagactatg caatgatggg aaggtgattg 240
ccccttattt tcattcagtg ccatggtccc tgttgttgta gtaatttatt tgtttagttc 300
atttttttt tcttaacagt caaggggaag agtgattcct cacactgctt tcaagctgga 360
ctgagccagt ctcattctgg gaaagaaatg ctgtgtccag aactcagcag ctccatctat 420
tttttccagt cgaaagaaac tgatctttag gcagtttttta cttgg 465

<210> 146
<211> 351
<212> DNA
<213> Homo sapien

<400> 146
ccagccgggg taatctgtat gtggcggact tgagctacga cgtgggcggc aagtgcctgt 60
ttgaccagat cagcggcgtg aagcttatgc caactcatcg tttgataaat ccgaggatca 120
gttcaagacg tcgcagcggg tgattttggg aacgtcgttt tcggtcagta aattgtgggt 180
agcgacggag tggttgatcg gcaagaatga tccgtatatt ggcgggagca gctataccga 240
[illegible] 300
ctacttctga cttaagatct ccagcgtttt aactggcctt atcgcaggca a 351

<210> 147
<211> 654
<212> DNA
<213> Homo sapien

<400> 147
acttattttt aattactgaa tatttcttag acgttttggg acagatttta tgtaatcttt 60
ataagtatga tttctgaaga aaagcaaatg cattagtatg tttgccttaa acttgtagac 120
taaaccaagt attgtaaaat aaacagcgat aacagtgata gtttttaact ctatggtcat 180
tgtatcactc tggaaaatgt ggagtagctg taataaatct actcctgtat tatgctttac 240
agtgcaggtc ttagtttttc tttttctca tttcttttga aatggcatct cgaacaaagt 300
ccaccaatcc ctttacaaaa gaatgaactg ctcctctgtg tgtacttcat agaaggtgga 360
atcggacaga ggcaggttag tgacagttat tcctgaaata caggagcaga gtacagtctg 420
ttgtggtttc ccggattccg cgcctagctc agccaattaa gcatgagaca taggccattg 480
agccacttag tagttatgcg agtggataga ttggtatgta agagggaaag aggtctgctg 540
taaagaacaa cacttgtttg tctgtgggga aagaaaagca gaatcttgag atgaaagttg 600
gcatacaaat aggatactat cgccagtagg ttatattaca aaacatttat cggg 654

<210> 148
<211> 539
<212> DNA
<213> Homo sapien

<400> 148
tgaatatcat gagggtgatt ttcacctgat tgcaaaactg ccatagtttg aaacactttt 60
tcaatttacc agacacactc tgtcaagact tcatatactt ccaacttgca agcctgtgtt 120
ttgccttctc caacctaaaa aggaaaagct ttaaacgatg aacttacatt ctattaaacc 180
atcagacttg agcttatcca tctgtttagc gtgaatgtac aaaccaggta catttccacc 240
aaacacatag aaaaatcttg tgcatcacag ttcagctaag ggtagtagga caatccttac 300
aatcctcctt ggatttcttt tttaagatgt caaagaagca ggtaagcaac attgttcatt 360
tgttactggg tgttctagat caaaccttca caagctatat atatagcttc atatgctata 420
gcttacaaat ggggtaacaa agtaaaagaa aagaacaaat tatactttga cactttatag 480
tcaaagtata attaaaaaag aaatcctaca gtgggtaatg gagaaataga taatttttc 539

<210> 149
<211> 273
<212> DNA
<213> Homo sapien

<400> 149
tttttggtca ttctcctcaa ggagccgctg gatagtagtc ttgattgact tccaccttgc 60
ccctcataca gtccggtact aaggccaccg acatcccgag gaacctccgg aaccacgacc 120
gccaagcaac tcgacccacg ataggtgggg cctacgctct cgaagttgat tggatgctcc 180
cgcctacagg gcggggtaca gaagggacgt catttgtgac tggacgcgca agagctatac 240
tcagcagctt tcctctgtcc cagcccctag aac 273

<210> 150

<211> 200
<212> DNA
<213> Homo sapien

<400> 150
gtttttacta ccgtatggcc catttaaaag ggatgtgtac gccttacact ataaccctta 60
aaccacctag aaatatgaaa ctcaaactgc cactgacctc cctcaccaag ctccataaaa 120
gtaaaaaatt ataacaaacc ttattaacca aactgaacga acatatgggc gattgattca 180
ttgcccccac aatcctaggg 200

<210> 151
<211> 515
<212> DNA
<213> Homo sapien

<400> 151
ctgtagcgat ctttaagaat attttatata tgaaatctgg atttagggtt cccatggtct 60
ggcaccactg ggtacagtag ttctacatgg cagtaattca ttggagttga agcagtgagg 120
aaagagtcaa gtactagtct tttatcctca gtgtccagtg actgtcaaga gaaatgggac 180
tgccttctgc attgggatat gtgggttaaa gagtagtcca atatagaaga gtgagaaagt 240
gmaccctctg aggcatagta atgttttatt kraaaacatc tcacatgtat tgaatactta 300
sataggatgt attctgtatt actgaatttt ccagattatt gaagcaatca cctttctgtg 360
tttaaagttt tagaaagaat gcttttaaaa atgcttaaca taagataagc ctgttttcat 420
ggtgcaaggt ccttctatg aacatgaatc actggactct gagggttgga ctaagatcac 480
atctacatcc cttttaaatg actagtgtgc tcaga 515

<210> 152
<211> 243
<212> DNA
<213> Homo sapien

<400> 152
atttcaacaa catacttgtc gaggtagtta taaatcttct tagggggagg tggtggtttc 60
tgttggaatg ccaattttac agcttctgct gctgattcag gttctttaat tatgcttttc 120
tttgagtctg cttcagatag cacaacaaaa aaatgatgac acttttcaca cttgacaaaa 180
cgggtggatg atacaaaagg tctctacatg tgtgcacaag tcgccacatt taggacagcg 240
cag 243

<210> 153
<211> 620
<212> DNA
<213> Homo sapien

<400> 153
ttgtcttctc taccttacca tagccagttg ctttcatttt aaaccagagc aagtaacata 60
ttagtgactt gaatcttcat aagttaaagt aaaaaacagc aaaaaaccta gatctttgtc 120
ttttagaaca cagaccattt tcaggaaagc agttagctaa gtgtttaatt catgaatatt 180
gtatactgca tcccctacca caatttacac aatcctgtgg atagtcctac ctcaccctgg 240
tcaacctaca tgatccttaa gctaatggcg gatcacgatg accttgtaga catgcacaca 300
actatacctt tgtccaacag atcataatat atctgctatc caactggttt tacctgccta 360
atcctactga tttgggcact gcttgtatag tctctcaagt tcacaggaaa tgttgatttt 420
ctaaggtcct catttttaca gagtatacag gcaaagtgac aggggaaaag gaattagtct 480
aagagtaagg ggatgattat tatattgagg ctaaaaccac aaagtggctc aggctttaaa 540
aaaaaacact gtggataatg acaaaaagca taagtaaaaa tattttgaga aaaataaagt 600
acaagttttg aacaccccc 620

<210> 154
<211> 843
<212> DNA
<213> Homo sapien

<400> 154
cattgttagt gacccaagta aatttatagt ttttaagttc agaggaaaaa taaagcctat 60
ttttgttaa cagtcttaat aaataataaa atggaataaa gaaaccaaaa aaaaaagaaa 120
aagtttgtat gaaaattcat ccctatttct ttattttgga ctaagtagtc aaatttctac 180
tatattaata ttatgtaagc gacacccatt taaattcact ctctttgata gaaaggtgag 240
ttgattatca cacctgctat tttttcactg ccaaaragac tgcaataacc tccctccatc 300
accctcaaaa aacaaacaga aaccatctga ggcatagcca ttgtttacat attgtgtttg 360
tgtgcaccta tctacaacgt tctttcttct aaggagttta tctgccaata ttttcggctt 420
cagcagcagc gctcttcttg acagactaag agaaggatct acagaaaagt catctgatta 480
aggttttggg tcaaattaaa actctctgga cagaatcctc tttccttcac ttggatttct 540
gcaaacagaa agcagattat tctcctggca caatagcgac tctagaaacg cttatgtttt 600
tcagactttg gcagaacttg ttaagaacag catcatcata atacatttgt acaaactcga 660
atttcagtgg ctcttttgtc ccacatgatg catgatgaaa tttataaagg tctgttttac 720
ccccacaggg tcatttcttt tgtgttccta cagagccaat aggcttcatt taagtccaag 780
ttattatatt aaccatccct ttcactagac tagagaactt ctttttcatg gtccatatcg 840
tga 843

<210> 155
<211> 674
<212> DNA
<213> Homo sapien

<400> 155
tttcgtgtca gccccaggtt tgctccagct attcacaagc agaatataac acaagaaaaa 60
caattcatat cccttaggga aaaaagagga tcaattcatc actcaatatt taatacagcc 120
aaaatgagct gccaaaacaa gcacacacac aaatactgtg aacagaaaaa tacaagaaaa 180
tgactaagct gggagtcttg acggggtatg gacattgctt aaagcactta tcagtcccca 240
gaaaaaccaa accaaaaaca tttttacga tggcatggcc tcatggcccc ctttaaaact 300
gttgatggta acaaagggca gggggtgggg agagaaaaca caatcactgc tcccttttttg 360
ctcgccagtg tgactgcacc cctcacggca ccggcatgta cacaactacc acacaaggag 420
gaccaagtcc ctctgctggt ggcctcctaa aaggcaaggc ttgagttttg gctgatgagc 480
aagttctctc cgttaccaat ccctgccaac cagcactacc atggctgaat tgatctaccg 540
ttttcctgag taaactgtaa ctggctacag tttcggtaac atggaaaaga actcagctac 600
tacagccaac tgcaatactt caggaacccc ctccatccct ggggctcctc actcctagtg 660
catcttgatt ggat 674

<210> 156
<211> 671
<212> DNA
<213> Homo sapien

<400> 156
cctttagtga acacctttat ctccatgtcc ctcttagagc ccagagagct gcccataggc 60
attttccaga attcctcatg tcacctagtt caatttccat taactcagat cagccattgt 120
gattcaccat ttgtcaggct ctcaggttta acaaaaccta ctatcaccat catccttcaa 180
cagccacagt ctgaattgag ccaacatttt tttttctttg agaaagaagt gggctggggc 240
acaactttta gtctgagggg agctagtagt cggcttgaca attaaagcca tccataacaa 300
cttttcctca aatgtgttga ctcctcaggg gctaaactgc tcttagctta gaattatgct 360
ttactagaga tctaccatat aagtgggtta atcactacca tcctgtaact agttatatag 420

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cttccagaca tgagggagac atcaaacagg gatggaagca accccaagga tatgcaagaa     480
gggcatgatg aaccccccttc cctctggcag gagaacaagg ccaaccaagg gacagactgg    540
aaagcactta gatgtttaag gaggagaaag gggaagcttt gaccagtcct tgccttttgc     600
caagttcagc cagttctccg ctgcttgcaa cctctagcgc agtaacattt tgcagaattg     660
cagattttcc c                                                          671

<210> 157
<211> 474
<212> DNA
<213> Homo sapien

<400> 157
cgcgttcttt aattctttaa gcctagaaag tcctttacac tacttaccta aaggtcccaa      60
agtaaaacac acactagtag taaggctagt gcatttccct tctagcactc aaagaaagct     120
taacattttt gacagtttgc aaataccgcc ttgtatttct gattcagcct tattcaaagt     180
atcataataa aatatttatt aaatstatgt tgatctgcgt gcatttatga tctccagatt     240
aacgttaggc ttctctgttg ggccctaact tggaggtgct tttttggatc cctcctcccg     300
tgattcattg taatttcatt tcccttgtca tggctctgac cagagaagat tctaaatatc     360
tgccccccaaa gccaaaatta tatcttttga aaagtgaaat gaagagttga gtcastaatt    420
tattttagat attactgcct aaaacaattc cccaaaattt atggaagttg gagg           474

<210> 158
<211> 584
<212> DNA
<213> Homo sapien

<400> 158
ttggattctg cagttccaca tcattcactc cggcaaagga gagaacttgt aacaaagatg      60
agtgccaagt ttagtcaatt taccctacct ggaatactat atacaactct gggtctcatg     120
tgtgttaaaa tacatacagt gaagctgagg aagagccact gaagtaaaaa gtattgttta     180
caagttggaa aggatgtaaa aataatctaa agtatactaa gtcaggaata aaaggcagag     240
ttaataaaat tgtggctggt actgatagac gaaacagata tattttctaa atcctggaat     300
aattattaaa aaattttaca tgtatcaatg gattccagac tccatatttt aagtttcaca     360
actactgtca tttaaaacta taccttattg aacgtctccc actctcaata aattacccca     420
aatcactctt ctccaaaacg taaatttgga acacactgac ttacaaattt tgggcttaat     480
ttataggatg ttgtggccct caaaaatatc attgtgggct aaacaaaata aattcttgaa     540
acaattctaa aaatcaatca ttgtccaaaa tgaacttttt ctaa                      584

<210> 159
<211> 671
<212> DNA
<213> Homo sapien

<400> 159
cctaatttta ttacttttct tgccactgct attattgata gaaatacaat taaataatta      60
agatgaacca atccattgga agattactaa aattgtatct tcccaatgcc tcctacagta     120
agatttcttt ataattataa cccttggaga caatttgaac tttatttaaa tgttctgctc     180
aaatctaaat ttccttctcc taggctgaag cctgatctaa ataaggaagt agttgggata     240
tatccacagg ctgtcgaaca tggagctgca tctgagagac aggtggcagc aaccaaaagc     300
aaagcaggga ctgagaacag gcaggttcca agagcaaaat ggaacttgaa agccaagtat     360
ggttcactgt aaaggagaaa atatagaaat acggaactag aacacctggt ctgggatgtg     420
gtaagcaccc aaaatatagg aaaactgtat gaattcttgt gaagcagtaa actatgatag     480
taatcatgtg acacatatga taacaaactc aaaacaggga aaagaggggc tttattcaat     540
gctggagata agtgaaaaaa aaagtgaagt gtctcaagga cagaagttat catctcaaaa     600
aggcatatca gctagatctc gcggaaacca tatgattatc ataattctag actctgttcg     660
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gtattacaaa g 671

<210> 160
<211> 315
<212> DNA
<213> Homo sapien

<400> 160
ccagagaggg agggctctgc ttcaccacag ggcaccagaa gaggactggt gcgcgggaag 60
accaggtaat cataatgcta ttaaaaatag cagtaatcat actgttttat acattgtata 120
atgtcataag gattttaact ttcatgtaac ataattgctg taaaagtttc cccagtttgt 180
tttgtgctat ttaccctggt gttaaaatgt gtaagaattt acattttagg tatgttaggt 240
ttattccttt ttatatggtt tctgtttgaa attttgattt tagaagacat tcattctcaa 300
ggtcataaaa cacac 315

<210> 161
<211> 607
<212> DNA
<213> Homo sapien

<400> 161
tttytgtgtc accttggata attgcttaac ttttaaaatt tacgttccct catttccaaa 60
aagggattat aactcactgt tattttgata attgagataa atgtacgtac aagtgctttg 120
aaactgtaaa gtgcattata aacagaggga tttaccatag aggttctacc ttgatgtatc 180
aagagaagcc ttttctggaa tctggtgcag ccttgtgaga tgctgttagg taaggggact 240
ccttggtaga atttcttaca tttgtgtaaa aagttctggt tcctgagtaa ttccaaagaa 300
gatgctatga ggagttcact gtgcctttga tttgatccca atgggtcaga atatgttttc 360
tcattcagta ggctactaca ggatttgaag tagaaaaaac agggtccagt gaccttcacg 420
ggatcctaga tgttcatgaa tttcaatcat ttgagattgt ggggtgtggt ccaatgctgc 480
tctcaaaaag atgttgcctt tcttcasaga gcattaataa ctaaaaaatc ccctggtccc 540
aaatttattg tgtgtmtctg aaggctttaa ctgaagaaat gaaawgcaca ctcatggaac 600
aaactaa 607

<210> 162
<211> 443
<212> DNA
<213> Homo sapien

<400> 162
tgagttttga aaaagtgaat aatcaaaagg aaaataattc cttgttgttc ataaattaag 60
catcactaaa gtctcttgaa aggcatttct gtattgggca agatttaaaa tactaaagcc 120
ttaggtccta ttcatattta aagtagcatg tttgtaacct gttactattt ggagagagaa 180
gcagttgcct gccacaattg aagactacct ttcaaatagc aaaagagaga gagaaggctg 240
atatttcggg cttttaaata aagatttgtg tggttctgct tttactgtaa ctgtcacttt 300
cccagtgaaa atgatttcat atacatttga gggtcttaca sgtatgggta aagttctata 360
aattgcaaca aaatgatacc caatttcatt ttatcctttt tgtattgtga aactggaaac 420
tttatgacat tgtaaattat cag 443

<210> 163
<211> 686
<212> DNA
<213> Homo sapien

<400> 163
caggcaaatt atagtcaaat acatcacccc cctcaggcat ctgtggcaag gcatccctct 60

agagaacaac taattgatta cttgatgctg aaagtggccc accagcctcc atatacacag 120
ccccattgtt ctcctagaca aggccatgaa ctggcaaaac aagagattcg agtgagggtt 180
gaaaaggatc ccagaacttg gatttagcat atcaggtggt gtcgggggta gaggaaaccc 240
attcagacct gatgatgatg taagttagct ttgtatattc ttgaaacacc tataaagttt 300
tatttaccga ttgaatactt aaatgtaagt gaaaatctaa tagatgttta tgtaaatcta 360
ggtagacatc acctggattc cccactctat tgcttacctt tttgttttgt aatttgatca 420
gttcaagtta aaacaattta accaaaaact atgaatgttt atgatataat gaaatgattg 480
ttaactttct tattgctttt tcacacacct ataaaagtaa ttttattact cccaagagaa 540
atcactaaag gcagaattac tagaggtaaa aataactagg gttggtacag tattactcag 600
gagaagtcaa ggggagaaaa cttgtcccaa tgattcaaaa taattttggc atgggggggg 660
ggagggaaaa aaatttggct tccttt 686

<210> 164
<211> 706
<212> DNA
<213> Homo sapien

<400> 164
ttttttttgt ttcatttgct gcttaaaata aaaattataa attagattta aatggagcac 60
taattataaa acagattgca agtaccacca tttgaaaaaa aaaaaaaaaa tcagtggatt 120
tccataacac agaaaatgca tggacatgca tctacagtag agttaaaaat ttcctgtgac 180
taaaaaatta aaaactggaa tcaccagtag caaatgtata gtcaatggct atgacaagaa 240
cagatcctgc cgagctcata aatgcaatta ttggcttttt tgctttataa aaaagacatt 300
acatatttta ttgcattatt ctcctaataa aaaacatact accacgtagc tctccccatc 360
cccattcttt gcttccagat ttttatagaa aataactgtt ttagtctggc cttggaaagt 420
gaacccacca gcaccacctt cacctactca ctcttcaatt caatatgcac atagcaaaag 480
ccaacacttc aaatctcttg cccacatcaa aaaaagtagt ttcaggagaa aaacattaat 540
accagttgaa taaaaataag ggcataaaag ctatgagaga gatagctctg ccatctgtct 600
ctgggctaaa aatcaaggct aactattgcc tttggcacca caaggttcaa ggtccatggt 660
tttattagaa aagtccccac aaaaaaatta aacccccctc acccca 706

<210> 165
<211> 427
<212> DNA
<213> Homo sapien

<400> 165
tyywgggcaa ttaggcagga gaaggaaata aagggtattc aattaggaaa agaggaagtc 60
aaattgtccc tgtttgcaga cgacatgatt gtatatctag aaaacccccat tgtctcagcc 120
caaaatctcc ttaagctgat aagcaacttc agcaamgtct caggatacaa aatcaatgta 180
caaaaatcac aagcattctt atacaccaat aacagacaaa cagagagcca aaatcatgag 240
tgaactccca ttcacaactg cttcaaagag aataaaatac ctaggaatcc aacttacaag 300
ggatgtgaag gacctcttca aggagaacta caaaccactg ctcaaggaaa taaaagagga 360
tacaaacaaa tggaagaaca ttccatgctc atgggtagga agaatcaata tggtgaaaat 420
ggaaaaa 427

<210> 166
<211> 124
<212> DNA
<213> Homo sapien

<400> 166
accatgtttt cgttgtgtgt gagcagggaa gggaactttc ctgccttatt taaacctggg 60
ccgaggattc gtggaatctg cttgatcaga gactctgagg ccaaaaacgc atcatacttc 120
ttgg 124

<210> 167
<211> 232
<212> DNA
<213> Homo sapien

<400> 167
tctgcatagc aaatatgatt taagaattta acatcattat ttgatcacaa gcgtaaatat 60
gtcaccataa ataaatgtaa attcattgta caaaaattcc caacaactct taatacaaat 120
atggtacatt tgacagtttc tgaaacagat tatttttaaa actttttaaa acctaagctt 180
tattttttttc ctggttatta gacacacaca aaaaaaataa aaagaggctg gg 232

<210> 168
<211> 677
<212> DNA
<213> Homo sapien

<400> 168
tttcacaatt aaccaacatg caaaaattct cagactaaac actgagaaat tcttcataca 60
atgcatttgc caccttattg catttttaaa atctttattc tatagtgaat tggtattccc 120
aatctgccta agcaaaggca tgcccttcta acaagatttg cttagagcag aggtgataga 180
aggaagaatc cgaagaccct ctggcatggc aatctgggag cagcacattg ttgatggagt 240
ccaagtgagc acatttcaca caattcattt agtgacaagt gggcttgctc ccttttcatc 300
caggaaaaaa actactcaca gaccactgcc cagaatctgg aataagaacc ctcattttaa 360
ggtattcttc ccaacaaata aatatctaaa tattgaaagg gggcatatca gaaaacttaa 420
aagacacaat aaccaaaacc aaaaccctct tcaaaacaag taagcaatgt ctgtatttag 480
ttcactctaa aacattctta gcttttcttg cagtttgttc ctaaaagatt tgattgggca 540
caagaggaac gaaattatta ataaaataaa agcttatttt tgtttttgct gtggataatc 600
ggtacaaaac gtttccagat ctgagactta aatggatctt ttaaggtgaa aaggagaatg 660
ccaggttcta ctgaaat 677

<210> 169
<211> 635
<212> DNA
<213> Homo sapien

<400> 169
ttaagaagac tgggcattta tactctctct tgctagtcag cctggagcaa gcttggagca 60
gacgcacatt tttgtactgg cacatattct tagacgacca attatagttt atggagtaaa 120
atattacaag agtttccggg gagaaacttt aggatatact cggtttcaag gtgtttatct 180
gcctttgttg tgggaacaga gtttttgttg gaaaagtccg attgctctgg gttatacgag 240
gggccacttc tctgctttgg ttgccatgga aaatgatggc tatggcaacc gaggtgctgg 300
tgctaatctc aataccgatg atgatgtcac catcacattt ttgcctctgg ttgacagtga 360
aaggaagcta ctccatgtgc acttcctttc tgctcaggag ctaggtaatg aggaacagca 420
agaaaaactg ctcagggagt ggctggactg ctgtgtgacg gaggggggag ttctggttgc 480
catgcagaaa gagttctcgg cgggcgaaat cacccccctgg tcactcacat ggtacaaaaa 540
tggctttgac ccgctaccga cagatccggc cgggtacatc cctgtctgat ggagaggaag 600
atgaggatga tgaagatgaa tgaaaaaaaa aaaaa 635

<210> 170
<211> 533
<212> DNA
<213> Homo sapien

<400> 170

ctgtgatctc acaagtgtga aaaatcttat gaatgtaaaa tgtgtggaga ttcttctttg 60
tttttagctt ccactttggg aacatgtcaa agcacacatt gagaagtccc atgagtgaaa 120
gagatgttgg aaagcccttg aacttggtcg ttaggaaaca tccacactga agaggaacct 180
gactgtatgg aaggtcaaaa aggctgtatt aatttacatg caaaaagtca cactagagga 240
atgccatatc agaatgcttt tggtaaatat acatgtttta aagaggttat atatcattaa 300
taaaaatatc tagctggtct gaagaccctg agttatctca attgttcacg gttacagatg 360
gaactcttta ttattgagga gttccactct ttcccccatt tgtcactact acacttccct 420
agtctttaaa acaatttag gctgggtgca gtggctcatt cctgtaatcc cagcactttg 480
aaaggccgaa gcgagtggat catttgaggt caggagttcg agaccagcct gga 533

<210> 171
<211> 568
<212> DNA
<213> Homo sapien

<400> 171
cccttgscaa actttccctt aagtattgca ctacaagtct aagacacttt tcactcaaag 60
ttccttcctt ccttacctct cttttaactt ggagtcagac tttcatcagt ctgacaactt 120
ctccctgtct ccttcctttt ccccccttca caagcatttc acctaacaaa tttcttatgt 180
gcttaatccc ctcttagaag cagatgccaa gatgggatta agcacataag aggtcctgga 240
ctaatacaat gacaaaggct ccccttgaag catcacacta aaaggaaaaa aaaaaaaaaa 300
acctagccat tttacattaa ctatttctaa aatatagtat ttgcttccct atttgctaaa 360
acaaaatata ctaaacatga ctattccaaa aatctgtagg gtactaagaa tatgaagaga 420
ttcactctac ttcaggggat ggagttgtag tagaaaaggc tttgtggagg gagggtggtg 480
tttgaaatgt actttaaaag ccatcctcaa agcctcgagg gctatacctg gcctggtgat 540
tatccaagga cagtccattc aaacaggg 568

<210> 172
<211> 167
<212> DNA
<213> Homo sapien

<400> 172
ccatttacag gaatcagcca cttcagttca gacagcttta ttaaaccgcc tggagcgaat 60
tttcgaagca tgttttcctt ccatacttgt ccctgatgct gaagaggaag ttacttccct 120
gaggcacttg ctggaaacaa gcactttgcc aataaaaacg agagagg 167

<210> 173
<211> 391
<212> DNA
<213> Homo sapien

<400> 173
cctcccaaag tgctgggatt acaggcatga mccmccmcgc cctgatgata gacacgtttt 60
taacttctaa aaatatatga tcatgattgt gtctgtggag acttgcacat atactaaatt 120
ttaamcaatt agagatattt gttcattacc acattttggg agtcattatt tcctctatga 180
agagagaaag gaatttgata caagttcaca ggggcttcca gtagattgag acttttattt 240
ctagctgagc tgctgatgta tgaatttttt ttgktattat gactttcata tgtattaaaa 300
ataaaatgaa aaaacaaggg attaggtgag gaacctatac gtctctaata tgcaaaatac 360
cacagaaata atgactgktg ggaaaattag g 391

<210> 174
<211> 474
<212> DNA
<213> Homo sapien

<400> 174
gaactcagag agaggattgt caccccttggc atctgagctg acactataag gacaatgagg 60
agtctccttg gggatagatg gggagatgga aggacgatgc ctgtcctacg gggtcttgga 120
aggttaggga tacacactgt gagctgccac aggctcaaca gtacggatag ggggtgctgg 180
aaccagccag ggctttgatc accaagctat gtgccccatg cagaggaagg ggtagtggca 240
cactgaacca cccagccaca aggctatctc cccatacagg gcacctttaa aaaaattatc 300
cttacagggg aagacgggga ggaaggatga actgtgtgcg gtgatgttgc agtgagtgtg 360
agtttgtgtc cgtccgcttg tatgagggcc tacctttttac taactagccc ccaactttca 420
ttatctcccc tttttctgtc taccccttctg cctttttaaa gtggcttgca atcc 474

<210> 175
<211> 655
<212> DNA
<213> Homo sapien

<400> 175
ccttgcaggg gtggggatgt gtgggcttgt tcactgttac agcccatgta tacctgaagg 60
gcaacatgta cccacaaatg ttccaggagg taaataaaaa atacaattca gcctcttcta 120
aaccatcctt gttgatatct ctgctacttc cgaaagttaa ttcgttattt ggactccata 180
atttttccta ttaattcacc ctatgtccaa ctccaacagt gaaaaaaatt tatttaatct 240
ttgcaataag cctataggca ggcagcatta tcctcagtct gcagataagc taaggctcag 300
agaagcttgt atactgtcac ttaggtagta attgcaagag ctggcattca gacccagact 360
gtgggactcc tcactccatt ctctttcccc ccactaggct gctccttaaa atacaatgga 420
tgcttgatga acgcttgtgg gaatcctggg tggacacagt tcctttttcgg ccaaaagcac 480
cttgacgact tgtgaagaat taatctggaa aacttaacct atttataaaa acgtgttatt 540
aagggcaggt tattcccacc cccttttacca aagaaacccg ccctgacctt tttttactgg 600
gggttggtct tgggcatttt caacaagggg ggaacagttt aaaaattccc ccctt 655

<210> 176
<211> 660
<212> DNA
<213> Homo sapien

<400> 176
cctggtcaaa gtgggcatta ccattcaagc attactagac atcaccgtaa cgaaggctct 60
gttcacatga aactacccct tctccattgg gggctcagac tctgctctca tccaggatcc 120
tgaactctgc tccaggcacc tgttcaaccc tctctcccac ccactgcctg tcacttcact 180
gactccagtt acattgaaac aattttcagt ctaagggagg attttctacc tttcagagct 240
gacctccgac tttaagactt gacaggtatt tatcttgaaa ccagagaggg agctggagga 300
aaaaaaaact gagcaagcac atcaatgcct tttccacccct tcttcatcct ttccacactc 360
accgactgcc attaccaaaa cgccaagcac aaccggtttg gaacaagacg cattccgttt 420
taattaaaac caactcatta tgtattttag tggggggggaa gggggcaca atcagggttt 480
tcaccaccaa attttccaca cggtttctga acaccattgc cttttaaaaa actatttttc 540
cacctccaaa atatttattt aaattttatt tattacggag gtggtattct tcctttggga 600
gccaaattgg gaaatttagg gaaccttttt tattacccgg ttttttgggc gggtaaaccc 660

<210> 177
<211> 459
<212> DNA
<213> Homo sapien

<400> 177
ctttttctct tcctctgtgg aatggtgaaa gagagatgcc gtgktttgaa gagtaagatg 60
atgaaatgaw tttttaattc aagaamcatt cagaamcata ggaattaaaa cttagagaaa 120

tgatctaatt tccctgttca cacaaacttt actctttaat ctgatgattg gatattttat 180
tttagtgaaa catcatcttg ttagctaact ttaaaaaatg gatgtagaat gattaaaggt 240
tggtatgatt tttttttaat gtatcagytt gaacctagaa tattgaatta aaatgctgkc 300
tcagtatttt aaaagcaaaa aagggaatgg aggaaaattg catcttagac catttttata 360
tgcagtgtac aatttgctgg gctagaaatg agataaagat tatttatttt tgktcatgyc 420
ttgkactttt ctattaaaat cattttacga aaaaaaaaa 459

<210> 178
<211> 720
<212> DNA
<213> Homo sapien

<400> 178
ctgcaagctc ccactccttc catttatctt aacgcccagg ctgacttcta agctgctttt 60
cactttccta cctccactgc atttcgcccc ctgataattt ttgtaagctt acctaagcct 120
cccttctttt gagatcccct tcttaaaagg gtccattcta ttaaccctac cccatatcca 180
gttactttta ctacctgctg atctatcgct accttgtcca attcatggga attacagggt 240
gcactgggac aagagtaaaa tgatccaaca aacataatgt tgcatttaaa aaaataagct 300
aaaagatact gatgactttt tataactaca acatattcgt ttgtgaataa gaacatatat 360
agtaaaaaga tgaaaatgtg aacaggttga ctatttccta aatttatggc agaaggttgt 420
tctggagagg atgggaagaa aaaatgaagg ctggcagtga tgggtgggga aatgcaacct 480
ccaaaattat ctatctatat attttatta aaaacaccca cagtaattat ggcaaatgtt 540
aatggtttgt ttgttctaag gttttggata catttaagat ctcttgcttt ctgggtacca 600
tttcttttct tttcttttct tttttttca aattaattcc aaaagactta tatctgctac 660
atgaagaacg aagcaagttc agctctcttg gctgaaatgt tcaaatgctt gagggcaagg 720

<210> 179
<211> 427
<212> DNA
<213> Homo sapien

<400> 179
ctgtgaatct gtctggttct gaacttattt tttagttatt ggcaatcttt gtattactat 60
ttcaatctct tcctggttta atctaggagg gttgtatatt tccaggaatt tatccatctc 120
ttgtaagttt tctagtttat gcacataaac gtgttcatag tagccttgaa taatcttttg 180
tatttctgtg atatcagttg taatatctcc catttcattt ctaattgagc ttatttgaaa 240
cttctctctt cttggttaat cttgctaatg gtctatcagt tttatttatc ttttcaaaga 300
accagctttt tgtttcattt atcttttgta ttgtttttgt ttgtctcaat ttcatttagt 360
tctgctctga tcttcgttat ttcttttctt ctcctgggtt tgggtttaga ttgttcttgg 420
tttctct 427

<210> 180
<211> 728
<212> DNA
<213> Homo sapien

<400> 180
caaacacaaa agtcactgtg tgtgtgatgc ttctccaatt ccactcatcc tggctgccat 60
tcatgcacta gtgcatgtat gcatttttac atttttaaa ttacaaaaat caacctatta 120
taactgctta gatatatatg aagtaaaaat gaaagttctc cctttacatg acccatcccc 180
catcatttcc ctctttatct tatactgtca gcattcccag cttgtagcac agtgtctggc 240
aatagtaaat cctcaaaaaa tgatcaatga ataatttaat aatgattaat aaataaatta 300
atgatgatgg tgaagataaa ttttagcatt tattgaacgc taactacaaa ccagggagtg 360
tggtaaatat tttataaaaa tcaatgaatg agctaaaatg ccattctatt attttttgg 420
atacggttta atattttact cataaatatg cttaaagaat attataatta tatgacttag 480

aatggtaaaa caatatgtac agcagtatcc tattttttag aataaaaata taaatatgtg 540
ctcacatatg tggttggggc atgcctagaa acccgattag aacgggattt tttcttacca 600
ccattttttt tacctgggaa aaatatggga aaattttatt tcccttcttt ttggttctaa 660
aatttatata caggagccta tttggctttg gataaatcat tttaaaaaag gtggtttaaa 720
aaaaaaaa 728

<210> 181
<211> 546
<212> DNA
<213> Homo sapien

<400> 181
acaatccttt ggaagacact actgggcttt gggtgctgct ttttaataat tgagttattt 60
tgagcttgcc aagtaggatc tattgcctgg actaaaattt atttcctaat cttctgatga 120
ccaagaaagg aaaaattaag tttgcagatg ggagatgaaa tatagccagc gaatatgcat 180
actggttctg aatgaaagga attaactttt cagtcaagaa acagtctgca tgccgtaaat 240
tgaatttttc ctgcaactgg aatgattggt taattctttt tgaacactgg cctttctccc 300
caagaacact aatgaattgc taatattttt taaagaaaac tggtttttta attaggtaag 360
ctccacttcc tcttattttt taatccctaa agaaaactgt taaaagggaa tggatctatc 420
acgccttttc ttttaaaacc accttttttaa aaaaggattt ttccaacccc caatttgctc 480
ttattttaaa attttgaacg ccaaaagaag ggaaataaaa atttttccct taattttacc 540
ccctta 546

<210> 182
<211> 333
<212> DNA
<213> Homo sapien

<400> 182
ggccactctg actgggtctg ctaattcaca tgctctttgt gacatacggc tctaagaggc 60
agaggctgga agagaagtat gtgggttgtg ggatcaagat acccaagttt cagtcttgac 120
actgctatta cttagtcagg tgaccactgt aacttcatct tgattgagcc tcagatgtct 180
cacctgcaaa atggagtttg aaatttgcta tggttgggtg tcacacggat taaatgaaat 240
aatgcctgtt aagcgcctat ccagcactta ataagatggc cactgcatca taatgctttg 300
ggcacaagta acacaacatc caacccaaag ggg 333

<210> 183
<211> 393
<212> DNA
<213> Homo sapien

<400> 183
ctgaatttct tgggctttat gtggcagtgt ggtaaaaata tatgatcaga tttcactgtt 60
aagaaaattc tttcagcaat acatgtagag tcaagtttct tgcatggata actgaacatg 120
tgggttatga gattttaaaa aatgtctcgt gacaaacttt acggaaatgc aacaatctgg 180
acatctagtt ttgtctgaga gtggcgtgga tatgaagaac tgtgctgttg gtgctgatgc 240
cacactaagt tttggcagtc acactcttgg ttcttcatat ttgaggagat gggatggtga 300
ggaggcctgt tggctttatt ttattacgtg ccaccatcta gaatacagat tcttggatat 360
ttcatcttca caaaggtgaa gctgcaaact cag 393

<210> 184
<211> 700
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(700)
<223> n = A,T,C or G

<400> 184
ccaggscawt gaggaaaagr gaaagaatwt arrggstwtt caaataggaa aaraggaagt 60
ccaaattggt cccntgttkg ccagataacc atgattgkgk atttagaaam ccccatgwty 120
tcagcccaaa atctccttaa gctgattaag camcttcagt aaaktctcag gataaaaaat 180
caatgtgcaa aawtcacaag crttcctatm cgamcaatam cagmcaaaca gagccaawtc 240
atgagtgrac tcttattcac aattgctagt aagagaagaa aatmcctagg aatacaactt 300
mcaagggatg tgaaggwtct cttcaaagaa gaactacaar ccrctgctca aggaaataag 360
agaggmcmca agtaaatggg aaaagcattc tatgctcatg gataggaaga atcaatcccg 420
tgaaaatggk gatactgccc aaaataattt atagattcaa tgctatcccc atcaagctac 480
cattgacttt cttcmcggaa ttnggaaaaa tctactttac acttyatagg graccaaaaa 540
agaagccccwt gtagccaaga caatcctagg caaaaaagac caamcctgga ggcatcacag 600
tmcytgactt cmaactatwc taccaaggny tmcrgkgmcc aaaacagcac ggkacntggt 660
mccaaaccrg acwtwtwgac cmmcagacac agaacmgagg 700

<210> 185
<211> 192
<212> DNA
<213> Homo sapien

<400> 185
ccagyctttc ttttaagtaa gcgctttttc aagctcattg tagctacaaa gtcaataaat 60
tggtctttgt tatttttacc tgaaaaggct gttaaaggtt aaaatgacaa actcaaattc 120
aaagggattg gaggatttgg tgtttatgat ttctcagaac aacaatctag agaccaccag 180
ggtgggtttc ag 192

<210> 186
<211> 688
<212> DNA
<213> Homo sapien

<400> 186
gtgctggaat tcgcccttag cgtggtcgcg gccgaggtgg gatatttctt ctggatagat 60
ttcagatagg tagttccctc aaataagatt atatgggttt gcattttcaa ggcagagttg 120
tatacttcct gctctttatt taaataaaaa aacttgaaaa tctgttctgc ccagtattgt 180
aagcgctcag gtacaaatat gaatgaaaca atctctgcct aagtaacaca agtataggga 240
caagattctc agtaaaattc tcacgtgaaa tttgtaactc actagacact atcaggagat 300
caataattat gtaattaaaa aaaataatta cctgccaaac tgggttcttc tttggcactt 360
ctgcttggtt ttaagacaat tctcacatag aagcttatta ttccccatta gtcattccat 420
agatgtaaaa ctggtagaaa caggacttga attgaacatt ctttacaagt aagttatata 480
gcttctgaaa aaagggcttg aaaaagcatt tttggggact ataagaacct tcaaatgctt 540
tcccctctta acaaacctta aaattatttt gaaaataatt taagggggct gattttctct 600
tgtcaaaatc ttgaacccca cttaccaggt ggttggtcaa accaaagttc aaaaaaaagc 660
ttctggcctt tcctttatcc cacttgca 688

<210> 187
<211> 779
<212> DNA
<213> Homo sapien

<400> 187

gcaaaaaaca gatacatttt cagtgtttaa aaatgaacaa gtatggaaag gcttatacag 60
taactgaaaa gtctcctttg ggaagccaag gtgggaggat tgcttgaggt caggagttca 120
agaccagccc aagcaacatg gcgagacccc atctctacaa aaaattaaaa aatcagccag 180
gcatggcgga catacttgta gtagtaacta catgggaggc tgaggcggga ggatcacttg 240
agtccgagag tttgaggctg cagtgagccg caacgcgccc tgtactccag cctgggcaac 300
agagcaagat gctgctctaa [illegible] [illegible] [illegible] cctcatagcc 360
tgttctacaa aagtcctatt tcttcccaca aaaagcctct ggtacctggt gttagttctt 420
ggggtggaag attactttta aaaatagaac tatttttaa gtatatcttt tagggaactt 480
tagttcccga agctttagga aatgggatct tgaaaacaaa agggatttca atacctatga 540
caatgcttaa agaattattg gggcatttat ttttcaatgg agggtccaca aatctttgga 600
aacccttggc caattaccag aagccacttt aatttttgac cgaaaatgtt tttaaaaatt 660
ggcttttgga aaaactgtct ctttccccaa aaatgaaaac cttgaaaaaa aggggaattt 720
ttaaggttgc cccctcatta aattttaacc cctctgaaag aaaaccctct tgtgacagg 779

<210> 188
<211> 394
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(394)
<223> n = A,T,C or G

<400> 188
ggcgamgtct ggycaccatc atgcccttta atcaactcac acctgtttaa agagtgtttc 60
tgatttgacc ttcatccctt agtttactgg cgttaaaaaa agtctcagca attttcatta 120
tttctcgtgg gtctcattat caaaccttta cttatttcgg catatttcct ctgggcttct 180
tctagtttct gccttacaag caatgctgtt ctgtaaattt attgaaacct ctggaacatt 240
tcacctttag agatggagga tggaaggatt ggyaccagaa gagggctaag atacgttytc 300
tgtcttngag ctgaaagcac agyctactct ccttcgtttt gycgatgaga aaagttgagg 360
ccagaaggga ggtgacatgt ttagagtcac ccag 394

<210> 189
<211> 681
<212> DNA
<213> Homo sapien

<400> 189
aagttctgac tttggtctat aaaacagggt tattggctgt ggctgcactc aatatctaaa 60
aagttattag gaagtgcctc gttattgtca ttaaagatat ctaaatatgg tagaccaaag 120
gttgttgaga aacacatatt atggactgag ttctgtttct tctgctgtgg cgcacctaag 180
ctcaagcctt ccttctctcc ctccccttct ggccggcatg gtatctgagc tcacagacag 240
acaaggcatg ttagaatcat cagatcatga gcaccgtgct gggatttagc cctctccaaa 300
gtcaattctt acagtccata ctttgcttaa atcctcagtt gttgaggtct gctctgctgt 360
cagtaatccc agctataaat ttcccccaaa tgtggggcct agataaagta gaaggtggat 420
ggactcagct tattttcatg ggatgacagg aactggaaag agaaagggca ttgaaaataa 480
aaagttattc cagaatagca ttaaccctct tactgttcaa gaattaagaa agcctactta 540
gaaatgaggg ccttgagaat gatacccaaa tattggtctt tctaccaaaa aatggccttt 600
ccaaatatct gctttcctgt tccccaattg gctttttaag tagaattaag ttacctaaaa 660
ctttacctga agggtggttt t 681

<210> 190
<211> 839
<212> DNA

<213> Homo sapien

<400> 190

```
caaatacatg atttccattg gcatagactc ttctatagtc tctcaggcac accttatgac      60
taataagaac actgtcttct agatataagc caagttttag gagttatctt tgtagtttct     120
gtgttgagac tatgggtctt ccctgtgcaa agacttgatt agcaaatact atttgaaacg     180
atcccaaatt catagtgcag ttgaccaccc ttctgatcaa ggggatctct gtatatccca     240
tgaaagcttc ataggtctca ccctagatta agtgcttcac ttctcaagac agtgaacaga     300
tggaagactt ttgtagttat cattatacaa ctgtgccctg tgtgttttat tatacaacca     360
gagaactgag gcactggctt tacctgtcag ctacgccagg ggtgtgacgt catctttctg     420
acttgatcac acatgccaca ttgcttaata tttcaagctt agactgaaat aatcctgtgg     480
taaaaaattt ttgggggct ggggaggtaa agaacaaggg ggggaacttt ggaatatttt      540
tattcattaa tcatatttcc cgaattgtat tttattttga aatgaccata agggacttaa     600
atacgtattg tggttaaatt aaatggaccc aaatggaggt aagtaaacct aatgggacaa     660
atgaataaaa ggtttatgac tgggagcatt tacccatgaa cctccttaga agctatttaa     720
cctttctttt ggaaagccct gaaggctggg aacttaaatt ttaaagacag tacctatttc     780
cagaatcgct tccaaatggc catgttttaa agggccaaca ttttgggatg gccctgccc      839
```

<210> 191
<211> 697
<212> DNA
<213> Homo sapien

<400> 191

```
ccatcctgaa tactgatttt ctaatggaac tctattcaat ggcgattgta aaaccctgag      60
gctccgttac tattatggag catactttca tctcattctc ggctattggg caatatgtat     120
ctcataagat tttatcacat ttcacagatg aactgttaat tgattccatg ggtacgatta     180
ggcgagatcc aagctggagc tgcagctctg agtcccataa attctttgtg cttctgtaaa     240
gaataaatct gtttttaatg caaattaaaa ctactggcag ggaattttgg ctcccagtta     300
ttaaaagact ggaaatgtgt aagtggagaa aggcaataac tgcagtaatc tcttaccgga     360
ctctattata attccaaaca tacataatgg tgagaaaaac cgggaaggga agaatgtggc     420
aatgtccact ctttgcccca aacataaccc ttaatttcca tggcgggccc aaacactggt     480
aaaaaccaaa atggtaccct ctatagcatg caacttttat ttcactccaa acgaaaaatt     540
atttgacta tggcttggga aatccattag tagaagaagt tttataacct ataggaaccc     600
ggccatttca tttctaccaa atcacaggaa ttttagaatg ggcaaggaat ttacaggaag     660
acttgcccaa ttatcttttt ttgggggact aaaccaa                              697
```

<210> 192
<211> 687
<212> DNA
<213> Homo sapien

<400> 192

```
ctggttacta tagctttgta gtataattta aagtcaggta atgtgattct tccagttttg      60
ttatttctgc ttaggatagc tttggctatt ctggatcgtt tgtggttcca tataaatttt     120
aggatagttt tttgctattt ctgtgaagag tgtcattggt actttgatag ggattgcatt     180
gaatctgaag attgctttgg gtagtatgaa cattttaaca atattgattc ttccgattaa     240
tgaacatgga atgtttttcc tttatttggc gctctcttta atttccttca tcagtggttt     300
ataggtttca ttatagagat ctttccttct tttgggtaat tcctacgtat ttaatttatg     360
tatcgctatt gctaaatgga atgacttttt aaatttcttt ttcacattgc tcctggtggc     420
atattaaaag ctactgatgg atggtgattt tggattctgc cactttactg gaattggtgg     480
atcagttcta atcgttttct tatgcacccc tttacggttt ctacatgtaa gaatatatca     540
ccttcaaaca cggataattt gacttcttcc ccatccaatt gggaggccct ttatatcttc     600
tcttggcctg aaggctctac ttaaaacttc ttatcccttt gttggaataa cagtggggac     660
aaatggacat cccttgtcat ggtccca                                         687
```

<210> 193
<211> 493
<212> DNA
<213> Homo sapien

<400> 193
ctgctaaaat gatgttgcta aagcattcct ttttcttttg attaaacttc atgtttacaa 60
aaaaattaat tctagcagaa taacgaatgg ttttgttttc tagttctctg ctgaatgaac 120
agttttgcca attatcttca tagagtagtg atataatgaa tgcaacctca aatgcaaacc 180
aaccaattca cagtccatac cccaatcact tccttcatca gcctcaaaaa tcgctaagtg 240
aaccagtaga atggttttgg agcagtaata ggaaagcaaa tagaaagtca agggggactt 300
tcaacgccaa caagaccaat tcagatcctg atctgactgg tttctaatac aatctctttc 360
cagagtaatg gagcatgagt ctgccacaca gaactttaga gagagtcctt tatttcaaag 420
actgtaaagt tggaagaatt cattcatctg caaagtcaaa tgtcaaaagt tgtgcttccc 480
actcctcatc agg 493

<210> 194
<211> 424
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(424)
<223> n = A,T,C or G

<400> 194
cyagggcant tnagcangas aaggaaatan mggggattca attagggaac wraggakarw 60
caagttgtcc stgtmtgcag atgmsgtgat tgtatatcta gamcacccca ttgtctcagc 120
ccaaaatctc cytaagttga taagcawctt cagcarmgtc tcasgatscr acmtcwatns 180
gcraaantca cmwgcattct tatacaccaa tawcagacaa acagagagcc aaatcatgag 240
tgaactccca ttcacaattg ctacnmaaga gaataaaata cctaggaatc caacatacaa 300
gggatgtgaa ggacctcttc aaggagaact acmaaccact gctcaaggaa ataaaagagg 360
atmcaamcaa atggaagaac attccatgct catgggtagg aagaatcaat atccgkgaaa 420
atgg 424

<210> 195
<211> 229
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(229)
<223> n = A,T,C or G

<400> 195
tgaacacccct tnggaaggaa cctgctcgna tgtannanaa anggaccgga cagtctgcta 60
aaatcgccct ctttagacgc ggcgcgccgg ggcagagttt ttctctggtg ctttgacctg 120
tatttggttt aatggttttg tcctaatctc ttcaatcaat aaaattgtgc gtatttaact 180
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaa 229

<210> 196
<211> 557

<212> DNA
<213> Homo sapien

<400> 196
gcggtggctc atgcctgtaa tcccaccact ttgggaggct gaggtgggca gatcacttca 60
agttgagagt ttgagaccag cctgggcaac ataacaaagt gagatcttat ctctacaaaa 120
aaattaaaca aacaaaaaaa caaatcaaca ttcatttgca gggctctttg gtcttcttaa 180
agaacaaaca tatgaaataa ataagctgat tcttaaagat aacaaatata atgagctttc 240
tcaactgtaa aagcatctct aagttgttct atcaatgcat atccactcca tgaactaacc 300
tgaagaaagt gttgaccatt ctacccaatt aactgtaaac taagattgct ttaatggttt 360
gcctaaattt gagtaccttt aaatttttgc tttttatcca aattcattct cccttcttca 420
aattaaatag ttttgttaga aatcggataa gcaagatgta ctttttagaa agggcaatag 480
aatcctacaa catgctagaa tttgaaatgt ttttttaaat cagtmmtttc tctatgctag 540
taactaagaa aattata 557

<210> 197
<211> 624
<212> DNA
<213> Homo sapien

<400> 197
ttttactacc tatatttaaa atgatccctg acgcccctca agacaaatat attaattttt 60
ttactttgtg ggatagagat cagaaaaaga gtagagatga aaatactgga gaaacaatgc 120
aggagatatt tatgaggtga gaatgtcaag aaacttgtaa agggagaata ctataatgac 180
ccctgaagag agagctttag accagttgag tattagaggt tgccacgtgg ctattcatcc 240
actaataaat acaagaaatt actaaaatgg aagccactgg aaatatgttt tgaggaaggt 300
gagaatgtgg acctattata aatgggtgaa tatgatttct ttctcattaa gttcataaat 360
aactttcaga catgtaacag tttatgaagt gtgccgtagt catttagtat aagttttata 420
cacaaaagtg tttttactaa gactgtcaca ggttcttttg tgaatcttgt ttgtttttcc 480
tcattgtaaa tactgcaata gaacatttgt gtcttaacat aaggcaataa atgaccttaa 540
gaaccttcac ttttatatag aaagtggagg aaaagttggc agagtaattt gttgattata 600
gataaaagct cttgtagaaa ttgg 624

<210> 198
<211> 175
<212> DNA
<213> Homo sapien

<400> 198
tttttttttt tttttttttt ctaacactta tgcatttatt ttcatgtgta agaagaaaaa 60
cgtaactagc acgtgaacat gactgcatgg atacacggct cagcacgagg ctaaagtcag 120
aagtgagtga aagcaaaacc gcatgttgat ttaagtgaaa taacagaaca gaaaa 175

<210> 199
<211> 871
<212> DNA
<213> Homo sapien

<400> 199
ctgttgatca atgatgagct cccaagagta accagcctct atatagtcag catcactggt 60
ttctcaggaa aagcatcacc attgttcatc ttgctgcaaa atgtatgcac aagtatcttt 120
ttatttttaa aaaagccctg acattttatg actgctgctt ttctaagata ttttcaaata 180
tacagtccat acggttcaga cacaatggac tggggataga gacggctata gtgccgataa 240
tggagaaact agccagagct tcagatattt gttttccagg acatctcaat aattgggtac 300
acctcacaat atgtgagact tgacgtcgag tggcacggca tactctggcg caggcacttg 360

```
ataaagactg tgtttgcaaa tacttagcct gcacttcaag ataccaggca tctaagcacg 420
tcccagatgg tgacagttaa tcttcaaaaa accctatgtg gaagtattat cattgtcctc 480
attttacaga tgaggaaaaa gagacacagg gatgtcaata tcttcctcaa ggtcacacag 540
caagtaagtg atggaacagt ggctcagcca tgaagctatt gctgttaacc actaggttga 600
tttgccttca ttaatttctt cctaaaactg cacatttccc gttagtccct ctttttggtc 660
tgtcgtttga ctcttggcta ctgcttagag [illegible] [illegible] tgtaagttag 720
taaatatgtg caactccttg ggacatgac caggcaaaag ctggatacag aaatgtatgc 780
ccaaacacca tcccaagtta cccctaacag gtcttttctg gaccctgttt gtaaggggg 840
tatatttgga aaaattttta aaattttctg g 871
```

<210> 200
<211> 737
<212> DNA
<213> Homo sapien

<400> 200

```
gacattttga aggtaacagc aatatctgtg tatagatggg gttgtggttt tgttatttat 60
ctgctattgc tgaactatcc tttgtcttga gcgataaaag agaagtaaaa tactaaagaa 120
ctgaactgtc catttctgga ccatgagtaa agatgctggc tgtcaaactt cctgttcata 180
cattagttta tttatagagt gtactctcta tgtaaggtat tgactgataa tgttactttg 240
acttcagata gcttgcagtt taatggagga agaagacaaa catgcaaata actaggtcaa 300
tgaggcatcc tttgtgttcc attggaagct aggctgcttt gtaaccttgt taatttctgt 360
ggttttggag tgcattcatt agcaaataca ccccttgttc ttatccattc tctgcttttt 420
tctttatttg gcatttgatg acatttttc atgtggggaa attgagtcag gtgaggtgga 480
aagaaaataa ggacacgaca ctaaattctt tgatgttttt ccttaaaaaa ttgtttttca 540
agtgctccat aaagggttgt gaagttttaa gagccatagg acttggatta ttgtgaaaga 600
gtgtctctag ggggccaggt taaaccattt caaggactct ccttctctca tctcccttgt 660
tccacccagg gtggcgaccc ccaaaaagca caaagcctcc ctttcttcat gggaagggta 720
aggaacggaa gggaacc 737
```

<210> 201
<211> 493
<212> DNA
<213> Homo sapien

<400> 201

```
tctagaaatg cagcttttat ttattacccc atttctttca agtccttgga aaataacata 60
ttaagggtac aagaaattaa cacatgatgg aaaagtcatt gtgacgccaa tgaatttcat 120
tgagtataaa ctcatctact tcaaatttat tttataacac aacctaagat actcaagata 180
attatttaat ggttagctct taagttgaat tggtctacat aatgcgtggg aagaaaacca 240
gatttttagc cttcttgcca aatccagacc tctggttgat ttttctttga cagaagatgc 300
aagttatttt ccaatttcac aattaaatgt atttaacatg aacattattt tgctttaaaa 360
actataaaca ttgtaggaga attatagcca gtcttcagtt ataaccactc caccctcctc 420
actttctctc tctctctctc tttttttttt gctatgggat ttaatgggaa aaatatgtaa 480
aaactgtcac taa 493
```

<210> 202
<211> 283
<212> DNA
<213> Homo sapien

<400> 202

```
ccttttttatc tcagtgacac cgtccgggga cgcaggtggt ggtgactcaa ggctagcctc 60
aaagggcagc cccacctcct catcctggac cacagagacc acctgcttgg cgcgccgtcg 120
cttttccgag agggtggctg actccggggt gctggggctg ggctgccgc ccccgccgct 180
```

gttgctgtac tcctcgcccc agtcgatggg ggctgccctc ggacagcagg tgcaggttgg 240
gggcactgtt acgcaagacc atgctgcccg gagaggtaga tct 283

<210> 203
<211> 713
<212> DNA
<213> Homo sapien

<400> 203
ctgcttttgc gcaaggtgcc actggacgag cgcatcgtct tctcggggaa cctcttccag 60
caccaggagg acagcaagaa gtggagaaac cgcttcagcc tcgtgcccca caactacggg 120
ctggtgctct acgaaaacaa agcggcctat gagcggcagg tcccaccacg agccgtcatc 180
aacagtgcag gctacaaaat cctcacgtcc gtggaccaat acctggagct cattggcaac 240
tccttaccag ggaccacggc aaagtcgggc agtgccccca tcctcaagtg ccccacacag 300
ttcccgctca tcctctggca tccttatgcg cgtcactact acttctgcat gatgacagaa 360
gccgagcagg acaagtggca ggctgtgctg caggactgca tccggcactg caacaatgga 420
atccctgagg actccaaggt agagggccct gcgttcacag atgccatccg catgtaccga 480
cagtccaagg agctgtacgg cacctgggag atgctgtgtg ggaacgaggt gcagatcctg 540
agcaacctgg tgatggagga gctgggccct gagctgaagg cagagctcgg cccgcggctg 600
aaggggaaac ccgcaggagc ggcaccgcag gtggatccag atcttcggac gccgtgtacc 660
acatggtgta cgagcaggcc aaaggcgcgc cttcgaagga gggggctgtc caa 713

<210> 204
<211> 275
<212> DNA
<213> Homo sapien

<400> 204
gtagacaagt acagcagatc cagacaccag atctagctag gctaaatgta cagtatctaa 60
cttgatctga actgaacctg tattccttga tgatgcctaa aactacatcc atagaattct 120
ggtgaacctg taatacagtt ctgaaagtac agttttatat aataagatgc tgatctcttt 180
attctttcaa gtaagagtgc tagagaacaa attgtgttac ttgccttggg atttattgaa 240
cgtctggaaa atgctgtctt cctagatcca aacag 275

<210> 205
<211> 694
<212> DNA
<213> Homo sapien

<400> 205
ctgttcctgt acatttaact gaaaaaaaag taacttaaaa taatataaaa atagcactca 60
tgtatgtcct acagttatag gtgaaatttg atattgtttg tcttacatag catacctata 120
gacagcttaa gtaaagtgac tgttaagagg gttatgctta ttgatgaact cttgtagttg 180
cttaccagct ctgttagtat agttaaattg atctcagtag cttcaagtat ttataaaatg 240
gttgaagtcc aaatacatgt gataattaca atacactttg aattaatgga gggtgggagg 300
ctagttgaaa tgcattttat ttacccaagg agtatgttaa aatgatagtt ataaatgttg 360
gaagtttaaa gcaagatact cagtttagtt ctttacaaat cataagaaga acaaaattag 420
atgttgacat tgctatttta ggctgtgtgt tttccatatg cttcttgctt tccctgtcac 480
aggtggtggc agcaatattg gtgtgattga ggttatgctg gcaccactcg cacacaggcg 540
cacaatggtg ttagctgggc agaaagagtg gcatctctgg ctaccgggct gggggcgacc 600
tttaccatag gatgaagtaa ccttgcattc ggctgcaagg tgtactgtac cgtacacagg 660
tgctgggtcg atggccactt tctgcttttc tttc 694

<210> 206
<211> 704

<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(704)
<223> n = A,T,C or G

<400> 206
```
tttttttttg gnaaaaacag ggtttcatca tgtttgccag gctagtctca aactgctgac      60
ctcaggggat ttgcccgcct cacccaattc aactttcgta agtcagtatt taccatctaa     120
ctcagtgtcc caaaatttaa aatttccttg cactttacag caaaaataca tattggggct     180
ctactgaagc aatatataca tgtcaaaact aaaaatcaga aaagcaaaag ggtccattca     240
acatatagca gcttatattt aaatatgtac aggtatgtat gttttcacag ttagatcttt     300
aaaaaaattt atatttgata tgttcaaaaa tacttctatt ggctataaat aatattttaa     360
aagctcaact gatcaaaatg cattccaaga acatatcaaa ttaaataaat cttctacgtc     420
tttaaaaaca gataattgaa gtcagtaaag cttgaggttt gtgttaagtg tattctgtca     480
gtccctacta ctagggaagg cagaatcttc taaatacgat acgaaagaaa ctcccaaagc     540
ttggaaggaa tcggcagctc ctgaactttt tggggggggc atccctcttc gggattgaca     600
tgcgacataa atgttgcaag ctaagggacc cccccggggg gagtgggccc caaaaaaaac     660
cacaccttcc ccgtcaatgg tggtcccccc accaacctta aaaa                      704
```

<210> 207
<211> 225
<212> DNA
<213> Homo sapien

<400> 207
```
ccattttaac tgtactgcca atagaattct ggaattgtgg aaaattgtat cattgaagtt      60
cagtaggatg tgtggcttaa aaatttatca ggaccacaaa aaagaaaaca aaaatatttg     120
gtactgaggt tcattgccag ggcaggaggt atttccagaa aatactcatg cctgtgttct     180
gttccttgct ttcccaaata ctgcatgtga ctttcctaag cggca                     225
```

<210> 208
<211> 678
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(678)
<223> n = A,T,C or G

<400> 208
```
cctatatcta tcaaaaaaaa tccagttcct aactaataat ctcccaaaaa gaaagcacca      60
ggaccagatg atataaatgg caaatttttt caatcattta aggacaaaat aataccaatt     120
ctgtatcatt tcttccagaa cacttcctaa ctcatcgtat gaggccagca tcactctaat     180
agcaaaacca gataaagcca ttacaagaga gagtgacaga ccaatgtggt tttattgagg     240
atgcaaacaa aatttaacat aatatttaat agtgaaaaac tggatgctct ttccctaagt     300
tagagattaa ggaaagaatg tccccttcac tactcccata caacacctta ctgaaaattc     360
tagctagctt tataaaataa anaaaaacca naaaataaaa taaaaggtgt acagactgga     420
agatacagtg aaggaggaag aaataaaatt ttctttgcgc ataacatgat tcttctatgt     480
ggaaatcaca gagatttgaa catttttttt ttttgagaca gtttttgctc ttgttgccca     540
ggttggagtg taatggcgcg atctcggctc actgcaacct tcacctcccg aattcaaggt     600
gattctcctg ccctcagcct tcccggagta agcttgggga ttaacagggc atggcacccc     660
```

ccatgccccc agctaaat 678

<210> 209
<211> 720
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(720)
<223> n = A,T,C or G

<400> 209
attatttga accctagcat ttagaaatga aaaactttt ataacaatca aatacatgat 60
aaagtatgca aagagtagga aattattctg atgacatatg gagggttaca aaggagaaaa 120
ctttttgcta cctctgataa agaatagact aaattctcca agaccaatct gactggtgtc 180
ataataaaag gaggtacaca cggaagcaca agggatgtgt gcctctggag gaaaggtcag 240
gtgaggactc agtgagaaga caagccaagg agccaggtct tggaagaagt caaccctgtt 300
gacaccttga tcttggacta accctgtgga caccttgatc ttggactttt agcttccaga 360
actgcnagaa aataaatttt tcttgtttaa gccacccana gtgtantgtt ttgttatggc 420
agccctaaca aattaaaatt atattttaac agagaatata aaattctaat ataacatttt 480
acagtaaagc attcatggtc tttttttct tattaataaa tccatcaaaa cagaaagttt 540
tgcaaaattt taacacattt ctctaccact actgtttcta ctctcttaaa actactccgc 600
aaatataaaa atagaaggcc aaaatgcatc attaaaacga tgtttgggga ctaatggcct 660
taaaattcta ttacacttgg aaatatacaa atattcaaag attatctatt gatcacctca 720

<210> 210
<211> 277
<212> DNA
<213> Homo sapien

<400> 210
tccatgtatt tttatacaga atggaacaat atgtatgtat gcaatyktta cattccacca 60
tgaaataaaa cagtataatg aaaataacaa tagattcaaa caatgatatg ctattttttt 120
ttacctatga cattggcaag gtcttcttaa aaaatctgcg aataaccgat gttggagaga 180
tcatggggaa atagccactc aaatgttact catgagagtg tacatatgtg taacttcact 240
tggagggcaa tttggtgata catttaaaaa gttttgg 277

<210> 211
<211> 715
<212> DNA
<213> Homo sapien

<400> 211
gtggtagaaa tactaatttt gcaattacag aaaaaaacaa atgccattca catggttyct 60
aacaaaaagt gtctgaccac ccccaccccc cacccctcaa aaagccctta aataaagagg 120
aagatcaaaa gaaaacaaaa taattcccga gtttcacctc atacatacaa tatagcacag 180
gaagtggcaa agtttaaaat aatgccttta ctgttaggac tagtatgctg tcaaaagcca 240
caatcctttt gttttagtga gttgattttc aatagaaaaa tacaaatgaa catgtgttta 300
agttccaaca tggattgagc acctctgaat ttagtatcaa atgattaatt ttatttttca 360
gatgtcaaat cttagtataa aattttccat tattttaaac ttcacttgaa tctttaaaaa 420
agctgtctaa attgtactat atgagttcag tttaatcttc tgtaaaatgc taacaaattg 480
aactgtcagc agtcttttaa aaaaaaatgg gggctgggtt atttctagaa gaactctcat 540
taagctttga aaatcagaaa tcagagacaa ataacttcag atatagacta gctccacaag 600
caaatttata caattatctg taacagtcta tacatatatg tgtatatata tataccgtaa 660

ccactttcat aggtaaaaaa tattaacttc atgtcacact atgatcagaa gtata 715

<210> 212
<211> 717
<212> DNA
<213> Homo sapien

<400> 212
agcctccccc aatgccttaa aaggtcacag tagatctcag ctctgaacag aaactcaact 60
gaaactcttc ccacaaccca gcagtagata tattaaaacc tacaattttc agggatacaa 120
ccaatattta attcttttga gggttttgtg tttaatacaa ggacacaaac acacgtataa 180
aatgacgatg tcaatactga ttaaacagaa caacaaaata agaagctcaa attatcatca 240
gctattgtgt atatctgaaa taacaataat gcacttgatt ctgaaagaat gattagagtt 300
cctactctga aaatctaatt gtcttgatgt ggcgaagtga gaagaaagga tgatttttct 360
aatgaaaagc atgtatacgg gtagcccttt gcgagattct gtcaaaaccc tgaattttgc 420
attagctgtt ttaccaccca aacgttttta cccgaggatg tgcagcaatg ggaactctca 480
tacactgctt gtgggaatat aaatcagtat aaccactttg gaaaaccatt taacattgtc 540
aactacagct ctacacacaa gtgctataac cacccattcc actccagggt atacacccta 600
aaaatatgaa gtgcccatgt ctacccaaaa ggccgcctaa aaggaatgct tttgagaagg 660
gttaaccttg ttaattagtg gcaaaactgg gaaaacaacc cccaaatggt cccatcc 717

<210> 213
<211> 599
<212> DNA
<213> Homo sapien

<400> 213
cctgttttgg cgaggcagga gggaagcggg atgggagtgg tggttaggcc aagggtagtt 60
caaagcgatt cagcaggatg atgaccacag gagtgctgga gccgggcctt tcagcccccg 120
tgtggatgat gaccggccat ccaggacatg cgagggcttg ggacagtgga cagccagtgc 180
cacacaagga aggaccgatt aaatgacaca gttaaaggaa tttggcctag ggagtgcaag 240
ccagaaaggt ttggtctttt tatatatgta acattggaaa aaaggaacat ctcctgttcc 300
ctgtattaag ttttgacttt agctcagcaa atgcagtgtt tgtggcagta aatatactct 360
gataacaatg ttctttccca ggaatttaga gttttatgat ggttattgaa aatgtttaca 420
tgacaggctg tcaataatat tttttgcctc taaaaataaa acatacataa agtgtacgga 480
ttttaagtat gcaactcact gaacttttca taccgtaata caccacccta gtaaccctcc 540
cccagttcaa gatgtagact gtttccaata acccctcatc ctgttcctta atagccccc 599

<210> 214
<211> 789
<212> DNA
<213> Homo sapien

<400> 214
ccttatgaca aaccttgcta tgccaaggat atgcttcact atcttcatct atcaaaacac 60
tatgcatcat agatatctaa ttttttcatc tcttgcatga agtctttcct gatttccctc 120
tgctgaaatt tctctcttca aatgatgtgt ttccatagta ctttgtccct tttcaaagat 180
atatctcaca tcgcatattt taccacagtt agtttcattt cttaactctc acactagatt 240
acaaagtcaa tatagacaaa gaaatgttca accttatata acctcctctg cctatgctgg 300
taaattgcac ctactatgtg ttcaataaga gcttgtcttt ttcaatatac aaaactttgt 360
aaagattaaa gaccttgtag aaagtcaaga ggaagatagc aatttcactt ctaagaactt 420
accctaagga aacattcatg aagagataca aggggttatg tgcatggatg ttcattatca 480
tattattctt cattatgaag attatgatgg taataatgaa aatgattatc ttgtattggg 540
ccttatttga agtcaagcat tgagaatgta ctttatctgc attatctcac tgagttctcg 600
tagcagccct ataaggtaca gactgttatc taagcttaaa aaaataaagt taatgtccaa 660

ggtcaaacaa ctagtaaaag aagggggcta ggaaatttgg aacccccaaaa ggggcaacct 720
ctcaagggct atgaatcctt accattatta taaggaagct tggcccatgg tggcccaaaa 780
aaaaccggg 789

<210> 215
<211> 765
<212> DNA
<213> Homo sapien

<400> 215
ggatgtctga gcaggagaga gaccatgtga aggatggact gaatggagac ttgtatcaaa 60
gagtctgagt atcaaagact tgtattagag agggttgttg tagtaatcta gtcagggtat 120
gagaaatggt ttgtattaga gtgtcaggag tagtcgtggc aaaaatatat agatcaggat 180
gagggatggg cctcatctca caccctgact ccagtcaatg gcagtggctc cctggagtac 240
actactatag gaaggatttt gtaaagtttt gtctggcctc agtggagggt gaggtagggg 300
aggagttcta tgaacagtta gtggtgtctg ccatggttga aacaatggag aagggggaca 360
ccttttctgt gcagatgttg cttctggtag atataatcca caatgtaatg ggagaagtac 420
taagaatcag taaattatgg agggtgtaaa agactactga tatttaagcc tgcggaccgg 480
acttagagaa atgatagtta aaggagaaat atccagcaaa caaagatatg acattgaagt 540
ttgggactgc gattagtacc agagatttgg attggaggtg atttgtatag aatggatagg 600
tgattttact cttgcaattt ggattgaggg gtggggaaaa ccagaaaggg gctgggggt 660
aaattagtag aaggtcacct tgaattcatt gtggtccata tcaatgctga aactgattgg 720
ggaacttttt actcttgagt ccctttgtaa gggaacccca gaaag 765

<210> 216
<211> 780
<212> DNA
<213> Homo sapien

<400> 216
cctttttctg tggcaaatgg aggcttttca ctgcctgtag agacaataca gtaagcatag 60
ttaaggggtg ggtcagaaca tgttaagata acttactgta tatgtattcc cttgtatttt 120
gttaaagctg gaacatttga tatttttcca tttatttatg aaaaaatatg aacctatttt 180
catttgtaca aggtaattgt tttttaaagc aagtcacctt agggtggctt taattgtata 240
agtcaagcac atgtaataaa ttcaaaacct gcagttaaca ggatattaga catcaatcct 300
ggtaaccaaa tattaaagat tctctttaaa aaagactgaa catgtttaca ggtttgaatt 360
aggctaaaag gtcttgcagt ggcttttcat ggcccttcaa attggaatgg aactactgta 420
ctttgccatt tttctataaa tcagtacttt ttttttaatt ttgatataca ttgtgtgaaa 480
aaagaaaatg gctaataaac tgtattaaat cttaaacaat gtataaagat tgcacttagc 540
cagttcaaag tgtatactta ttcataatga attataacag ttatatttct gtgttttctt 600
gtaaatgttt cttttccctt aaatacagat aattcatttg tattgcttat tttattatga 660
gctacaacaa aaggacttca ggaacaagta atgtattagt atggttcaag attgttgata 720
ggaactgtct caaaaggatg gtggttattt taaatataaa tagctaatgg gggtggtaaa 780

<210> 217
<211> 810
<212> DNA
<213> Homo sapien

<400> 217
cttttaggca gcccggcacc ttcatccata ggcagagaga gaactgggtg ttggagactt 60
attcgagggt ataggaaggg ccctgtgaag ttgatttaac ttttggatgt cagactgtga 120
aagctcctga gaaacttggg gtaataggat cttcttttgg ggatgaaaat ggggaaggcg 180
tgaggaccta gactacttct ccctaggtca gaaaaagaga attacccctt gacaaatatg 240
atacctgcta ggtatttccc agggaaattt agggattggc gtctttccct agcatgtgga 300

ggaattggca gacagcttcc taagggcggg gagcgggggc ccaaggctga cactgcttgc 360
atccacgtga ccttaagtta tggcagatga ctctgaaacg gactgaggcc aatgagaaca 420
gatggatgga gcactcaggt tagacttgtt ccttctccta tgctggagga gagggatggt 480
tctctagaat gttggaggtg agttgagagc tcgcctcttg aatgttgaac agtgtactct 540
tctgaaaact gcatattcac tttatgtggt ttcagaatac tgggctcaat actaacataa 600
gaaagacact tcattgagaa attcttaagc ttacagaaaa cctatctctt tgcacattcc 660
acataacccc tagcaaaatg caggttcttc atacttctgt ccttttttcca ttggaagaat 720
tgcttaagga aaaattaatt cctatttatt cccacaaaag gttgggcatt gctttgattt 780
taccccatgg gggaatgtgc ctttgaattt 810

<210> 218
<211> 817
<212> DNA
<213> Homo sapien

<400> 218
ctgctccctt atggaggtct cttcattaat aattattgga tagatagaga aggtgagcct 60
gtggcttcca agtaccggct tttgctgaag gtctacatgg gaagaagagc atcatttgat 120
attcagtaga tctgccacac ccaactggct ccatctcctg gaaaacagca ctcactacaa 180
gcaactgtaa tagcacccag caatgaccac gctgctcctg ctggctcttc cgtacaccag 240
taaatgaact caccaatgta ttgcacacat acatttcaca gtagtacaat aaagccctgt 300
atcaggagtg gtaattcaat gacttgactc tatagtgcac tgcagcttta tgtcatacca 360
acattcaaat attcaaatat ccttccaatc catttggaca aaaatacacc atggctgcca 420
agacacatgt atttttcttt cttccatgga ctcctaaact gctcccacaa tcagcagtgt 480
tcttctctca gaaattatct taagcttctc tactcaatgg gaggtacaca cagagacctg 540
agaatatgca gaggccagaa tctctgtctg tgctagagat caactgtact ctgcccacct 600
ggggaacaca tcctctgggt aaagtactcg gaagtaaatt acattccctg gagacagata 660
cgggctttca ctgcagcctg ttagaaaaca caatgtctgt aagttacctc ataggtcaaa 720
gagtttttgga ttatattttt cataatgggg ctatggcctt tttaccctgg ttttaataca 780
gaaccacctg cagaaaggac attgaaatta aaagcca 817

<210> 219
<211> 661
<212> DNA
<213> Homo sapien

<400> 219
ggatgctgag gcaggaggat tgagtcctgg agtttcagga tacagtgagc tatgatcatg 60
ccattgcact ccagcctggg caacagagca agattctgtc tctaagaaaa ggaaaaagaa 120
aatgaataga tagtggtatt agatgttaat gacatcagtt gtttttattc tttattcttt 180
cttagaaaca gattagtttt ctcgaattaa agaactacca tttttctttt ttctacaact 240
ttcaagagct ggtgaagaaa tgatgtttag atttaataga tatagtagca gtcatatatt 300
aatagaatag aaactgagac tctaggaaaa agatagacat gagataagga gtaggcatgg 360
tagacatttc tagattattt atgaaaatgt tgtagaattc attttttttt ttggtctgac 420
ctttggcaat ggtgctgagg aagggaaagc cagcccatca ggcaaggctc tgttttctgc 480
attttatccc gtttgattct tctcgttagg attggagcaa ataatttcaa tatgttcttc 540
gctgggttta tcatagtgac ccttcattta aagggacttt taacaattga cttaaagaac 600
actgagatgt gatattttat tgggatttga aagttgccat tgggttttac cttccttaat 660
t 661

<210> 220
<211> 792
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(792)
<223> n = A,T,C or G

<400> 220
cctcttttta ttcctacaaa taattttcaa gtacacacaa ttgggtaaac aaagaaacaa 60
agccaccaag aatgaaaatc agtaggaata acgaacaaga ctcacagatg tcaaacaagt 120
ctgtgggtct tgcagacttc agatgttgga attattagtc gtggcaagng nncaaaacat 180
tagctattac cattatgttt accaactagt gaagtgaact atgagaggat atattaacca 240
cagaagttaa tagaagaata gactcctgaa aatatctgga tgctacaaac taaaatatag 300
tatataatcc ttcatagagt gtcagtgact tcatatttat aattacattt ttgtatatta 360
gcagtgttct agttcttact gccttatctt taagctgann nnaaataaaa ttatattttg 420
ggattcaaaa acacatagct aatgattact atgtggcagt gttacattac tttatcacat 480
atcattaaca taatctgcat gtgttcaaag agatcttcat acttctttgt agctcccact 540
tctttgtcgt ctttgtagct cccacaacat ctagaacagc acaaccgtat atggagaaaa 600
ctcagtctag tattcgttga atgactaatg gaaaatttag ttnataaaca gaactttctt 660
cattgnacaa attatcttgc agaagaataa tggccttagt ttaaaattat catatttacc 720
catntcncca ngttatttta tctcttttgg ctaanaattt tgaaaacggt accttttacc 780
ctttggcatt tt 792

<210> 221
<211> 759
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(759)
<223> n = A,T,C or G

<400> 221
cttttctgct gctccgggag gtggagtggc ctggcagagg gcacatggct gccacctgct 60
gcaaggaaaa ttctcagtga agactcctca gtatgaagga gataagcctg cacaatcagt 120
cactgataga tgcttagtgg aaaaacttcc aattcccatt tacagctctc agagctagga 180
ttaaaaactc ctggtcataa actcatgtga tgagaagtta tagcacgccc tcatttcta 240
catanccact tgcatttatg gttggctttt gaacttgcta gaagggaaag aagtgcaaat 300
gtgtcctcct tagagctact ctcctcccct tggtgggttt ccagtttgtg cattgtccag 360
atggcccagg agctgacgat caaagggaag aagtcatgtt tgtcatgaga atgctttgct 420
gcatcaggat tcagtgaagc tgttcaccgc ctggagccca tgcagcctca agaggcagga 480
tggagctcag aaaccatcac tgaggttaga aagtgagcac caaagttgag ggaagcccac 540
aggagtgagc cgaagtgctc cctttggatt tccaaagtgg gtgctgctgc ttcttccatc 600
agccttgctt ctgaccccaa tgcgttcctg gtgccttctt cttggcattt tgctgtcggg 660
ggcccaagga aaaaaattcc tgcatggcag tggtgaaaaa agatggctgc ctgctgaaac 720
ctgatttggc ctgggtaagc cttttggagc cccggttaa 759

<210> 222
<211> 699
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(699)
<223> n = A,T,C or G

<400> 222
ccttntnaag agttggcatt aattcttcac taaatgtagg agtagaattt atcaggtaag 60
ccacactgac ctctggnctt nttnncgccc gatgattttt aattagttga atccctttac 120
ttgttatata tgtattcata tattctgttc cttcttggat ttacttttat gattggtgcc 180
tattgaggta tttactttca gcttgtggta [illegible] 240
acatagaaga ttcaagaagc taaatgtagg agaatgtnta atgtaggana ntgaggcnac 300
natatcatca atgaatgact tgaagtttcc tctgttgtaa agaatgatat taccataact 360
gccatagnta atattgatgg tgtaagtcaa ataanaaggc aggaggaaag ggacatccat 420
cactgaacca canatcagag nctcattgaa gcctttgaga agaatccaca aaattttaca 480
ggataattca tttcctgcga tcaccacnag aagagaaact ggttaaacag acaggtattc 540
cagagtccaa aaatttacat ttggtttcng aaccaaagac ctcagctccc aggccacagc 600
aaaagggggc ttatgaattc cctggcaccc agncccaaga cccaanaacc tcatcttgat 660
tggtttnggg cttgggaaac caaaaaacca atgggtggc 699

<210> 223
<211> 598
<212> DNA
<213> Homo sapien

<400> 223
aaaaagagaa agtttcagat ttgccattca aggcttattt atatatatgt gtgtgtatat 60
aaatacatgc acacacttgc atacatatat atttttggct gggggagtgt gagttttgcc 120
tttctaaggg agggaccgcg caggctcctt tgttctgtat tctggcggag atgggtcctg 180
gccttgtgtc actggcttat ccttaaagat catctcccat cctccccagc gccatctgtg 240
tgcagcaacc agaaagggat gaacttggcc ctcttgcggg cctggacaag gtctcttcct 300
taccctttct gttgccagtc agcaacctgt aactcacatt ctcttcccag tgaatccctg 360
ggagcgcctg accctggtgg gctgttcagc ttcctgctgc tggggccagc aatttttgag 420
gatttatctt taggccaggc ttgcctccgt acttatccct gctctcccat ttctctcttg 480
tttgagagag aatgaggaag caaagagtga gaaagaatag gggctgaaga cgccactccc 540
agatggctct ttctatcctg ctcttctgtt gaaacacacg tgctgtgggc ctcaggcg 598

<210> 224
<211> 501
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(501)
<223> n = A,T,C or G

<400> 224
aaacctttat gatgacttcc ttatgaatta ctgaacgaac actggaatgg gactcaggta 60
tcctgaggac atctctcaac tctggcctta gttccccctc tgtaaaatta gggtgccaac 120
taaatgatct acaaggtccc ttccagcgcc gccattctgt aattacatca tgtgtaactg 180
tattaaacat acacaagtga ctgccaggca tgggaatgta acttccgagt aaatgctttg 240
gtttgttcag aatacactat gaacttcttt ccaaagacgg gttgtggtaa atagtggata 300
ttttgattat aagaaataga gtttccttga agctttagct ggagatacag caatagtgtg 360
gtgttcctac aaatatcaca gtgtattcaa acatattttt ctatcaaaaa tcatttttgt 420
aaaagctgtg tgtttttatc caacttgtga taataaatgt tctttatttt agaacaaana 480
aaaaaaaaaa aaaaaaaaaa a 501

<210> 225
<211> 295

<212> DNA
<213> Homo sapien

<400> 225
cctgtatagg gctcgtttcc ccacacatgc ctatttctga agaggcttct gtcttatttg 60
aaggccagcc cacacccagc tactttaaca ccaggtttat ggaaaatgtc aggaaaaaaa 120
aaaaaaaaaa cacatgcact cacacaatac ccaaacatca raattagaag ggcataaaac 180
agggggcttt ataggctgaa aaatatctta ratttcaraa cagaatacca atcaaatatt 240
gaaaattcct ttgttcaaaa cacaaagatg ttttgttttt aatgggagtt ttttt 295

<210> 226
<211> 372
<212> DNA
<213> Homo sapien

<400> 226
agattcctgg cttagagcat gcgagcattg aaggaccaat agcaaactta tcagtacttg 60
gaacagaaga acttcggcaa cgagaacact atctcaagca gaagagagat aagttgatgt 120
ccatgagaaa ggatatgagg actaaacaga tacaaaatat ggagcagaaa ggaaaaccca 180
ctggggaggt agaggaaatg acagagaaac cagaaatgac agcagaggag aagcaaacat 240
tactaaagag gagattgctt gcagagaaac tcaaagaaga agttattaat aagtaataat 300
taagaacaat ttaacaaaat ggaagttcaa attgtcttaa aaataaatta tttagtccgt 360
atgaaatgaa at 372

<210> 227
<211> 599
<212> DNA
<213> Homo sapien

<400> 227
ggcccccgtc gcgggagccg cttcggccct tctgggcatg tctgccatat ggctccaggt 60
ttgtttttct ccccggcact ctgacgggga gggctcccgg catctcctgg catccgggta 120
gaggacgcgg aggatgctga gctgctggcg cactgcagca caactagaga tgtacggatg 180
cccccatctt gatcttacag aatcagaggt acagccgcga gaaagagtca agaacagaca 240
gagtcgcttg aggactcagg agggtgtttg ctgcgttgac aacagactac accctcacag 300
tttgctctgc tcttccaaca ccagtggaag atgatcacat cccagggatc agtgtcgttt 360
agggatgtga ctgtgggctt cactcaagag gagtggcagc atctggaccc tgctcagagg 420
accctgtaca gggatgtgat gctggagaac tacagccacc ttgtctcagt agggtattgc 480
attcctaaac cagaagtgat tctcaagttg gagaaaggcg aggagccatg gatattagag 540
gaaaaatttc caagccagag tcatctggaa ttaattaata ccagtagaaa ctattcaat 599

<210> 228
<211> 343
<212> DNA
<213> Homo sapien

<400> 228
aaagtaaatt gtatgaaaaa ttcatttctt caattgcatt agccacattt tgagtattca 60
tgtggctggt agattctgta ttagcacaaa gatatggaac atttccatca ccacagaaag 120
ttctgttgga cagcactgca ttagaatatt ttcatactgc tcttcctcaa ttaattttg 180
ttgttaatgt tgatgtcttc attggatggg tcataatgtt ccatgaaacc gctcaagtac 240
acaattgtat gttctttgta tcccttacca caaatatctc gctctgctca tttcttttgc 300
agcttcctat aaagtttgtc ttcctcaaaa aaaaaaaaaa aaa 343

<210> 229

<211> 417
<212> DNA
<213> Homo sapien

<400> 229
ctcaagctgc agtccaccgg gtatggctct ggatggctcc cccaagggag caggtatgta 60
ggaggtgaag aaaactgaga tttcaagtat gggagagttt ttactatctc cattcctgga 120
ttaaaagtgc tgaaaaagtc cacagttaaa cattccttta ttcaccctat ggctcccaag 180
aaaagcattc ttcctctgga gtactggtgt actaagggga caatacacca aatttgttga 240
gtttacaatc aagtctacta aggttggact tccttatcag tttggcagag tcccagggca 300
gaataatcat ccatctacag gtctctgttt cctctccctc cgcagcagtg gagagcatcc 360
cagtgtttgg ggcactgtgt tcctcttcgt ccctgcacca gaccctggaa gccttgg 417

<210> 230
<211> 462
<212> DNA
<213> Homo sapien

<400> 230
gaaataccag aagagaaagt ttcattgtgc aaatctaact tcatggcctc gctggctgta 60
ttccttatat gatgctgaga ccttaatgga cagaatcaag aaacagctac gtgaatggga 120
cgaaaatcta aaagatgatt ctcttccttc aaatccaata gatttttctt acagagtagc 180
tgcttgtctt cctattgatg atgtattgag aattcagctc cttaaaattg gcagtgctat 240
ccagcgactt cgctgtgaat tagacattat gaataaatgt acttcccttt gctgtaaaca 300
atgtcaagaa acagaaataa caaccaaaaa tgaaatattc agtttatcct tatgtgggcc 360
gatggcagct tatgtgaatc ctcatggata tgtgcatgag acacttactg tgtataaggc 420
ttgcaacttg aatctgatag gccggccttc tacagaacac ag 462

<210> 231
<211> 328
<212> DNA
<213> Homo sapien

<400> 231
ctgtgggttt tcctaaacgc ccctcatctg gttgaagccc tagtgtttct ttctcacatc 60
agaggcaaat gcattggggt gggtctggtt tggacaataa atttcctctg gtttggacca 120
agaaaaacag agttctttga ccgctaacat atatgtaaaa agaaagtttg taaaaacaag 180
agttaaaatg cttctaacag tgtggtcatc actgcacagg acactggaat tggcattcgg 240
ggttgtgtct gtccatgtgg tttcgttgta tgtcatgtgc tctcagctca gacagagaca 300
tccaattgac ttctgacttg gggcattt 328

<210> 232
<211> 595
<212> DNA
<213> Homo sapien

<400> 232
cgccaatttt agcaaataag agattgtaaa agaagcagat tgaatgaaga atttttagct 60
gtgcagatag gtgatgttgg gatggaaaat gctaatcaac taccctttct tttatcaagt 120
aattaaaata aatctacata aagaaccaaa aaggctgttt tataaaagtg aaatatccag 180
tatttcagag ggccaggcaa gagcacttca gatgaggcag tcaaaatcat ttttttccag 240
tgaggataga ccacaagtgg gtggtgagac cattgaaagc ctttatcaac tgaagagtcc 300
atttaacagc ataatttgtg ggaagactgg aatagggctg aataaatgtg tttgaatctc 360
taattttata ctttcttttc ctgaggaact tgatttttct gtccctggat cgccttgtca 420
taattgggtc tgttcctttt actaccactc ttgagtccat atatgaaatc attaaagttg 480

gatgatcagt tttttataaa aatatatatt tttgtccaag aaaaaaaaaa gcatacatat 540
gtgattatgg ctaaatcaaa ggtaactgga atgtatatac ttttgctaat gttcc 595

<210> 233
<211> 600
<212> DNA
<213> Homo sapien

<400> 233
atgaaggtaa actctaaaat cttcataggt caacaaagaa aatttatcct tcacacttat 60
ttctagaaag cagcagggct tatttcctag attgcttaca atgaagctag aatatctgcg 120
ataactgtag agtttcaaaa aggatcccta gggctacttc tacgttctcc ttaccagttg 180
agcactctcc ataatttcca gacgggtcat gggggagaat gatagaaatg agcgtgggaa 240
gaaagacaat gaaattagaa atgggtgaga cacatggtgg tagaatgcta agagcaggga 300
tcaggacaat caaccaggtg tctaggaagg gtcaagtcac cagtgtcatc tgctgaccaa 360
tgttaggaag aaataaactc aaaggaaaca ccacattttt ccaattaaac tcaaatctat 420
tgacttgtgg tggttctttg atgttgtggg gactgctata acagaaacca attggatttt 480
caagggcaag aaactttgcc actgaataag atgatgtcat ccttcctgat aacaaatagg 540
aatgggtggt cagctctaaa cagcgtggac tgagggagtt gcttttctac aatattactt 600

<210> 234
<211> 500
<212> DNA
<213> Homo sapien

<400> 234
aaattcctaa ttcttttact atcttctcaa cttttcccaa agataaaata aatttcacat 60
aatttcatgg aggggaaatg gtagttgtaa aaaactacct caagtagcaa tcaccgctgg 120
cagtgttttc tcactttctg ttctgcaatt gcaatcacac ttccaaaaag aaaagcaaat 180
gtttgctaaa ccatagacag acaacctctt tgtgactggt attataaggt ttataatgaa 240
aacttatcaa atataaaagg tgctccctct tgaaaatgtg tattttattt gaagttttga 300
gtaagaggtg agtgtttggc aattttcaac actcccctca aaaatctccc aaagttgcaa 360
aaaagtcagt ttagtaaaat tccaagcact taaatgcttc attgagggcc agttgatata 420
cgcaatgcac taatgtgtaa aaattaaccg aatgcaacta ttttataatg gagagctctt 480
accttttcct tccagttttt 500

<210> 235
<211> 159
<212> DNA
<213> Homo sapien

<400> 235
aaaatttaca gataaaggca gttcaatact gccactgaga agtacatctc ttaacatata 60
caactttcag gccacagttt tgaaggtctg aagtattaag ttggtttgat gaattagtcg 120
gttggcactt acgaacacat ttattgcctt gccatcttt 159

<210> 236
<211> 254
<212> DNA
<213> Homo sapien

<400> 236
aaataagtga ataagcgata tttattatct gcaaggtttt tttgtgtgtg tttttgtttt 60
tattttcaat atgcaagtta ggcttaattt ttttatctaa tgatcatcat gaaatgaata 120
agagggctta agaatttgkc catttgcatt cggaaaagaa tgaccagcaa aaggtttact 180

aatacctctc cctttgggga tttaatgtct ggtgctgccg cctgagtytc aagaattaaa 240
gctgcaagag gact 254

<210> 237
<211> 591
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(591)
<223> n = A,T,C or G

<400> 237
tttttttttt tttttttttt ttttttcta atttttactt tttctcaagt ttaatgtara 60
catacaaraa aacatcaagc aatgtttatt gkgcaattcc aatcattatt tgcaraatct 120
tggtttaaag tcagtyttta tagccatttc aactgcttgg tttaaacaaa aagcaacaat 180
ctggttatyt acctataaat ttcatggtat ttytttaaac actgaagtac taaaagcact 240
gatgatttgt attataattt ttaaaatatt taaaacctac acagatttca taratcattc 300
cttttataaa ataatcaaaa taatttgatt atytggaaaa aaaaattctt gaaacaragc 360
cctttccagg tatyttcaat ctctgtaaaa ccccaaaccc caaacagagt aratgatgaa 420
ataaggattt ctcagttgcc caagactgtc tgaaatttaa ggttgaaaaa tggactggcg 480
tttttcatgt ttcctgngaa ttcanagctt acaggtggca tcaaaactca aatctctggg 540
atggctttac atggctttca ctttgatttg tttcattttc atttgcttct t 591

<210> 238
<211> 252
<212> DNA
<213> Homo sapien

<400> 238
aaatggcttt tgccacatac atagatcttc atgatgtgtg agtgtaattc catgtggata 60
tcagttacca aacattacaa aaaattttat ggcccaaaat gaccaacgaa attgttacaa 120
tagaatttat ccaattttga tctttttata ttcttctacc acacctggaa acagaccaat 180
agacattttg gggttttata ataggaattt gtataaagca ttactctttt tcaataaatt 240
gtttttaat tt 252

<210> 239
<211> 153
<212> DNA
<213> Homo sapien

<400> 239
ccacaataaa gtttacttgt aaaattttag aggccattac tccaattatg ttgcacgtac 60
actcattgta caggcgtgga gactcattgt atgtataaga atattctgac agtgagtgac 120
ccggagtctc tggtgtaccc tcttaccagt cag 153

<210> 240
<211> 382
<212> DNA
<213> Homo sapien

<400> 240
aaaaaaacca tctaaaagtg gtttttaat atatatattt tttccaaagg aagaaatttc 60
ttgcttttac tcagggaaaa aaaaaaatta aggtacattt gagtagaatg atttcatcta 120

aaagagttct ttcaggagac atctgtgatt cactgcattg tttttatttt cttctttttc 180
ctcttctttt ccaacatttc taccattttc ctcttcttgg ttgatatcag gccactttct 240
tttgttgctt tcttactgtc acctgttaaa ccgcgtttct ttgtgttagg ttttgaccgc 300
ttttcttctt tgtgcactgt gtcaccaggc tccttttttgc caattttgga ctgttcttta 360
cttacaggag aaggctctgc ag 382

<210> 241
<211> 400
<212> DNA
<213> Homo sapien

<400> 241
ggcatgagcc accgcgcccg gccctatctt ttacttttat aaatagagat gaagtttcac 60
catgttgccc aggctggtat cgagctcctg ggctcaagcg atcccccaac cttggccttc 120
caaagtgctg ggattacaag cgcgagccac cgaaattatt cttaactagc aagactaggc 180
tctgacatca catccttata gttacatccc tttaagcagg gttcagccac tcactctgca 240
cctggagaac ttgatggtta tccctcgaag tgacagtcct gcaaatgaca aaaacactcc 300
aaatctatta ggttggtgca aaagtaatta cgcttttttgc cactgaaagt aagtcccaca 360
ggaccctgag ggaaatggga gggtggggta tacatagcag 400

<210> 242
<211> 75
<212> DNA
<213> Homo sapien

<400> 242
actcacatat gcagacctga cactcaagag tggctagcta cacagagtcc atctaatttt 60
tgcaacttcc tgtgg 75

<210> 243
<211> 192
<212> DNA
<213> Homo sapien

<400> 243
gctccacatt tgtagcgaac actttgactc caaagagaag gaggaagaca aagacaagaa 60
ggaaaagaaa gacaaggaca agaaggaagc ccctgctgac atgggagcac atcagggagt 120
ggctgttctg ggattgcccc ttattgctat gggggaggag attggtgcag agatggcatt 180
acgaaccttt gg 192

<210> 244
<211> 616
<212> DNA
<213> Homo sapien

<400> 244
aattttatag caatatactg accattctaa aaataacaaa atacatgttg ctctcaacta 60
catagttaaa aaaggtagta aattctctta cccaaaatag aggaggggtg ggctagtgag 120
ctgctcaaac atttgtaaca aataaaaatg tatctatata catataatga tcatgttttc 180
atagcctaaa atcaccatac aaaatctaat aataaaattg tgtcgtgttc aggagttggg 240
aagccaacac attaaattaa caaagtattt ttggtatatg taaataatgg gatagaatct 300
ctcgaatcag gattgtccca gaagttctaa ggcagatgtc aatgacatgc acattgtcca 360
tgttcagtaa ttttcaaaga ctagaataaa ctatgtaaac tattcaatac aattcaatat 420
tacttaactg ctaaaaagta cttcaagatc ttgcactgcc ttgagtgagt ataatcaaat 480
tagtaattgg aaaatagctg taatagcagg cactgaagaa ttctgacaaa taccaataa 540

ctgtttgttt ttaccaaata aactggtaag atgatatcac aaagggtttt aagttatttt 600
gctatacaag gttttt 616

<210> 245
<211> 165
<212> DNA
<213> Homo sapien

<400> 245
ttggaacagt ggattaaaat ccagaagggg aggggtcatg aagaagaaac caggggagta 60
atttcttacc aaacattacc aagaaatatg ccaagtcaca gagcccagat tatggcccgc 120
taccctgaag gttatagaac actcccaaga aacagcaaga caagg 165

<210> 246
<211> 229
<212> DNA
<213> Homo sapien

<400> 246
tgtactggat ccctccaggt gggggcgact ctcacctgac tattacaata gcctcctaag 60
tggtttccct acttgcaacc ttgcccgtat aatatctatc ctccacacag caggcagggc 120
gatcctttaa gaatagaagt tagatcatga aaatgctctg ctctgatccc tgcaaaagct 180
cgccacctcc ttacagtcac cgctgaactc gtagcagagg ttcaggagg 229

<210> 247
<211> 338
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(338)
<223> n = A,T,C or G

<400> 247
ggaaaccgtg tgtacttatc ctggatgatg ccaccagtgc cctggatgca aacagccagt 60
tacaggngga gcagctcctg tacgaaagcc ctgagcggta ctcccgctca gtgcttctca 120
tcacccagca cctcagcctg gtggagcagg ctgaccacat cctctttctg gaaggaggcg 180
ctatccggga gggggaaccc caccancagc tcatggagaa aaaggggtgc tactgggcca 240
tggngcaggc tcctgcagat gctccagaat gaaagccttc tcagacctgc gcactccatc 300
tccctccctt ttcttctctc tgtggtggag aaccacag 338

<210> 248
<211> 177
<212> DNA
<213> Homo sapien

<400> 248
tgaaaacaaa tgaattctca actcctacgg ttcatgtaga gtttagagaa aatttccatc 60
attgtcatca ttgaactgtg aacctgggaa gccagatcat gattaacact gacatcaagt 120
ttcaagttgc agatcaatgc acccagtgtt cagatgaggc aaacttctcc gtgacaa 177

<210> 249
<211> 263
<212> DNA

<213> Homo sapien

<400> 249
aaagtaatga ctttattaat aaatatacat ccatatgatg atgtagatac aaatcatgaa 60
cactactcca ttcccataca cataattgca cacgagtagc tcaagttcat ggacataaaa 120
acatacacag tatctattca gactttttac agcagaggac agcgtgctta ttatcagtta 180
attggtaatt attttctcca aaattacctg tggaaaaaag aaattctgaa aacttaaaag 240
aatcaaagtg atctgattac ttt 263

<210> 250
<211> 333
<212> DNA
<213> Homo sapien

<400> 250
aaaaaaaaca acagcgtaaa tattagccca caagagcagt cctaaacaat cacaattaca 60
ctgtactacc caagaagact gtttattgtg aagcatttac ctttcaaaaa atcattacat 120
ttctatttct tggtggagca gcacattgtg gagtgtgatt cttaattctt cattgagttt 180
gtcaatagga cattgatgct ggataggttg tcttttgttt ttatgcctca gaccatcttg 240
tgagattgtt tgcctatctc ataatacagt tttatgcaga aaggttgaaa ctatgtaaat 300
ggtttttatg gaaattatca gttacaatat ttt 333

<210> 251
<211> 384
<212> DNA
<213> Homo sapien

<400> 251
aaaccatttg tacaaaactt ctataaattt ttctctctct ttctctctta tgtacaaaaa 60
tatcttaata tatccccgaa ctggttagga tagatacaaa tagatttttt ataataaaaa 120
attcacaaaa gattggaagc attctataat gaaaatggta gaaaagacag tgtgagggaa 180
gccatggggt ttgggaatcg ggccctggag gagaagcaga gtttcaaagg gctgagaata 240
gcatagtttc actgtaaacc aatgtctaca gcttattggg gtgggggcta ctgagacgaa 300
agacaccaac tcgtttctag agggctaaga actgcacttt aagaaagggc ggggaggtga 360
agggacccga gcaagaactt tcag 384

<210> 252
<211> 211
<212> DNA
<213> Homo sapien

<400> 252
aaagcagtct gaaaatggga catctgtaga gaaattcatt tccttcttct cctccggatg 60
tggaatggaa gctttgaggg aaggaaaagt aggaaaagag cgggatggga tgggatggga 120
tgggatggga tgggatagga agagaggctg gggaatgggc agagaagggg gtgctgagtg 180
tgctgtgaga tagagcaaga tcacaagaag g 211

<210> 253
<211> 135
<212> DNA
<213> Homo sapien

<400> 253
aaaaattgtt tcttgacaag ctgacttggc acttaagtgc actttttat gaagaaaaag 60
tacaatgaac tgcttttcct caagcaataa ttgtttccaa cttgtctggg aattgtgtgt 120

ctggtaactg gaagg 135

<210> 254
<211> 361
<212> DNA
<213> Homo sapien

<400> 254
cctgtagccc ctgctacacg ggaggctgaa gtgggaggat cacttgaacc aatgagggtg 60
aggttacagt gagcccagat catgccacta ctctacaggc tgggtgataa gagtgagacc 120
ctgtatcaaa aaaaagacaa ggaaaaaaaa aactgggccg tttgtttttg cagaatgtct 180
ctcaatttgg actttttggg caggaataca atacaagtga tacaaatgct tctttaacat 240
tagaacctgt ataaaattac cattacagac cttgctattt tacttatagg taaatcactg 300
tttaccaagg taagtctttt gggaatttcc aaaaatgaag tccatggaca gttaaaaact 360
g 361

<210> 255
<211> 331
<212> DNA
<213> Homo sapien

<400> 255
aaaaaaataa ataatccacc aacgtgattg accttggcga gatcatgttt ctagtctata 60
cctcagtttc cccatctgta aagtgaggat aatgtcccac cccatgtaac tgtggtgagg 120
accaactgca acactgtgcc tgcgagtctc cttggaaaag tgtaaggttc tacacaaatg 180
gaaagtgatc tgatcacact cagtgtcccc agcccagcct ttcagtgccc tggccctggg 240
gtgggggaca atactctcct caccccctc actagtcttc atgaatagca aggaggccat 300
aacataattt ggtctaaacc ccttcctttt t 331

<210> 256
<211> 186
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(186)
<223> n = A,T,C or G

<400> 256
cctttgggcc cttgcacttt gacctgcaat ggggccacac cagccttgct tgtgtccacc 60
tggaaggact gagggaggtt ggcacgaacc atgcctgggc tcaggccggg cccanagcac 120
ttgaccttgg acgcatctgt cacatcatgc acagggacct tgaaaggact gcctggcact 180
tgatgg 186

<210> 257
<211> 255
<212> DNA
<213> Homo sapien

<400> 257
ctggggtccg tcaccgacct ttggggaact gggctacggg gaccacaagc ccaagtcttc 60
cactgcagcc caggaggtaa agactctgga tggcattttc tcagagcagg tcgccatggg 120
ctactcacac tccttggtga tagcaagaga tgaaagtgag actgagaaag agaagatcaa 180
gaaactgcca gaatacaacc cccgaacccct ctgatgctcc cagagactcc tccgactcca 240

cacctctcgc ggcag 255

<210> 258
<211> 604
<212> DNA
<213> Homo sapien

<400> 258
ctgaatttgc aatggagttt ggtggtgcaa tcggtattga ttagtttggc atagacagat 60
gcagcagttt agagcaaaat cgagaaaatg attttttttt tcctccttga tttcctggca 120
gaagatatct tactttttca gcaaactttt cttttaacac taaagcagcc tagggcaatg 180
ccagatactt agagcttttc tcttgattat aagtagaaat gggggtgtct gggctagagg 240
tggagggtgg atgtgctgtc gtcacagtct agctggcagc aagcaaggca aaagcagaga 300
ctgctctaga agcggttcca agcagcagag acgtcaggaa aggcacttct tagtaccaac 360
ctctatgctt taatagttgc ttgttaagct gcttcatggg ttgagacaaa ctaccagcac 420
ttcaaagagc tcagttctct gctcaactct cttctctagt tacattattt tttttccttc 480
aggagactga ggcaggaaaa tcgcttgaac tcaggaggtc gaggccgcag tgagccaaga 540
tcacaccacc gcactccagc ctgggccttg caaagtgcta ggattacagg aatgagccac 600
cagg 604

<210> 259
<211> 429
<212> DNA
<213> Homo sapien

<400> 259
aaaaatgtct gtatcgagat cttccagttt gaagtcttcc tcctctgtgt cttcccaagg 60
ctctgtggca agctccactg gttctcccgc ttccatcaga accactgact tccacaatcc 120
tggctatccc aagtacctgg gcaccccccca cctggaactg tacttgagtg actcacttag 180
aaacttgaac aaagagcggc aattccactt cgctggtatc aggtcccggc tcaaccacat 240
gctggctatg ctgtcaagga gaacactctt tactgaaaac caccttggcc ttcattctgg 300
caatttcagc agagttaatt tgcttgctgt tagagatgta gcactttatc cttcctatca 360
gtaactgctc cgtgttcaga ctcctggttt cttccaggct tacagtggac atcatcagct 420
tcctgcttt 429

<210> 260
<211> 385
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(385)
<223> n = A,T,C or G

<400> 260
ctgcaacaca tgcagcacca gtctcagcct tctcctcggc agcactcccc tgtcgcctct 60
cagataacat cccccatccc tgccatcggg agcccccagc cagcctctca gcagcaccag 120
tcgcaaatac agtctcagac acagactcaa gtattatcgc aggtcagtat tttctgaana 180
cgcatatggc agacggattt gcgtatacca aggagagtgg cataggaggg aaaagcatat 240
gtggctgaaa cctgtaagtt ggtgttggtt atgcagaaat gtgtaacaga tcaaacggtc 300
ctctcaagtg tctattanat aggcaataag aactgcagtg tagctgagta acatctttta 360
gctgactata aatcactttg ttttt 385

<210> 261

<211> 230
<212> DNA
<213> Homo sapien

<400> 261
[illegible] 60
gtggtttccc tacttgcaac cttgcccgta taatatctat cctccacaca gcaggcaggg 120
cgatccttta agaatagaag ttagatcatg aaaatgctct gctctgatcc ctgcaaaagc 180
tcgccacctc cttacagtca ccgctgaact cgtagcagag gttcaggagg 230

<210> 262
<211> 198
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(198)
<223> n = A,T,C or G

<400> 262
atgttaagta aacatgaaat ctatataaca gaacaaaaat tcactcttat gtcaatgtca 60
gcgtgttaat gtagatctat ttactganac agactctgta gtggcagaga gtggccttgt 120
taagccagga ccctgttctg caggctgtgg gtagaagcta ggaagtccct ggagtttcac 180
ccagcttttc catgaatg 198

<210> 263
<211> 157
<212> DNA
<213> Homo sapien

<400> 263
aaaatatatt tctaaacaga atgggccgac tcagtcacag taactgttga tctccatagt 60
agagcaaccc acaaagacag aactgatttt tttcccataa tcaggggtga aaaatataca 120
acttgtttct gaaccaaaac cacaatttct gcagttt 157

<210> 264
<211> 290
<212> DNA
<213> Homo sapien

<400> 264
ctggctactc caagaccctg gcatgaggct gaggacaact tacaagggct tcaccgaagc 60
agtggacctt tattttgacc acctgatgtc cagggtggtg ccactccagt acaagcgtgg 120
gggacctatc attgccgtgc aggtggagaa tgaatatggt tcctataata aagaccccgc 180
atacatgccc tacgtcaaga aggcactgga ggaccgtggc attgtggaac tgctcctgac 240
ttcagacaac aaggatgggc tgagcaaggg gattgtccag ggagtcttgg 290

<210> 265
<211> 234
<212> DNA
<213> Homo sapien

<400> 265
aaaaaaagga aaggaaagag aggaaaagaa aataaaataa gacgatttat tgcttctcct 60

cagcatcctc cttggtctcc tccttcaccg agagagcttc tagcttttcc gccacttttt 120
cggcatgatc atttttgcct gatcctttct tttctctctc ttcgatctct ttcctgcatt 180
cttcaaactt tgttttgaat ttctgtgcat tctcagcatt caggaagcgg atgg 234

<210> 266
<211> 335
<212> DNA
<213> Homo sapien

<400> 266
gtcctcatca tcccagtttg aggcagtgct ggagtgggga aggccgtctt agaccataga 60
ggttggaaga cgctgagaga tcatccagcc cagccccttg atgttacaga gcagaagaca 120
gatgcccaaa caggagaagg cacttgccca cggtcatacg gcaggttgcc acaaaaccaa 180
gatggcagcc cttcctcagc gtgcctcact gccactccca gagccaggga gccccataaa 240
acccacatca tgtcttaaga gtatatctgg ctccttgacc agcaatcggc cctgggagcc 300
accaggtggg aaaagcgcct ctgccagagt ccagg 335

<210> 267
<211> 619
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(619)
<223> n = A,T,C or G

<400> 267
tggagctctg acgaagggat cggggaggtg ctggagaagg aagactgcat gcaggccctg 60
agcggccana tcttcatggg catggngtcc tcccagtacc aggcccggct ggacatcgng 120
cgcctcattg atgggcttgt caacgcctgc atccgctttg tctacttctc tttggaggat 180
gagctcaaaa gcaaggtgtt tgcanaaaaa atgggcctgg agacaggctg gaactgccac 240
atctccctca cacccaatgg tgacatgcct ggctccgaga tcccccccctc cagccccagc 300
cacgcaggct ccctgcatga tgacctgaat caggtgtccc gagatgatgc anaagggctc 360
ctcctcatgg aggaggaggg ccactcggac ctcatcagct tccagcctac ggacagcgac 420
atccccagct tcctggagga ctccaaccgg gccaagctgc cccggggtat ccaccaagtg 480
cggccccacc tgcagaacat tgacaacgtg cccctgctag tgcccctttt caccgactgc 540
accccanaga ccatgtgtga gatgataaag atcatgcaan agtacgggga ggtgacctgc 600
tgcctgggca nctctgcca 619

<210> 268
<211> 147
<212> DNA
<213> Homo sapien

<400> 268
cctataaccc agacaccagc atggacaaaa ctcagttata ctgaattcag agacaaaatt 60
cagtgacact cttctaccac ttatttaggg ttctacagca tttcactgag cagacttagt 120
tttttgtttt tgttttacaa acctttt 147

<210> 269
<211> 325
<212> DNA
<213> Homo sapien

<400> 269
ctgagctgta ggaatgggtt cttggtacac aagatagtat tgttgagcta gttttcgagc 60
tctgtgcaca agcactctgt aatcggggcc catgccactg tacaccaaac ctatatgctt 120
ggtaattggt tctactttgt gtacacttcg ctcatcatac agaatggatt tctgtttttt 180
ctcagttgct aataccacac catttgcagc tttaattccc acggacgggg ctcctccagc 240
tacagcagcc aaagcatatt caatctggac aagcttacca [illegible] [illegible] 300
cgaaaagctg tacccgcgct ccgcc 325

<210> 270
<211> 428
<212> DNA
<213> Homo sapien

<400> 270
aaacatatgg taaattaccg agtgacacct ctgggctaga gacctctttt gaggggagtt 60
tgcaaactac ggattcaatt tctttaacag ttatgaagtt ctttaaagaa cctgtttggt 120
attggggggt tgtggtcacc tgtgcttttc tgagatttgg cccctacatc taagttgttg 180
aatgcatgtg tgtagagttg tttatggtgc ttccctttct tcttagaagg gtctatagta 240
atatcccctg ccttatccct agtagtacta atttgtgttt tcttacttct tgacaggcaa 300
acacatcaga gcataagtgg ttcctaatgc caagctgacc tcccttgatc tctgtcttct 360
acaggatatt gacatgggac ttctttatta ccttttcagt tcactgatac cttcaaatag 420
ctttattt 428

<210> 271
<211> 206
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(206)
<223> n = A,T,C or G

<400> 271
cgtcccggag cccacggngg ncatggctgg canagcgctc tgcatgctgg ggctggtcct 60
ggccttgctg tcctccagct ctgctgagga gtacgtgggc ctgtctgcaa accagtgngc 120
cgtgccagcc aaggacaggg tggactgcgg ctaccccccat gtcacccccca aggagtgcan 180
caaccggggc tgctgctttg actcca 206

<210> 272
<211> 83
<212> DNA
<213> Homo sapien

<400> 272
ctggcttccc tgagaactca acaatgcctt ttcctgaggg ccttcctcga tcatccacaa 60
tgactacagc cctctctacc tgg 83

<210> 273
<211> 472
<212> DNA
<213> Homo sapien

<400> 273
ctggagaagg tgtgcagggg aaaccctgct gatgtcaccg aggccaggtt gtctttctac 60

tcgggacact cttcctttgg gatgtactgc atggtgttct tggcgctgta tgtgcaggca 120
cgactctgtt ggaagtgggc acggctgctg cgacccacag tccagttctt cctggtggcc 180
tttgccctct acgtgggcta cacccgcgtg tctgattaca aacaccactg gagcgatgtc 240
cttgttggcc tcctgcaggg ggcactggtg gctgccctca ctgtctgcta catctcagac 300
ttcttcaaag cccgaccccc acagcactgt ctgaaggagg aggagctgga acggaagccc 360
agcctgtcac tgacgttgac cctgggcgag gctgaccaca accactatgg atacccgcac 420
tcctcctcct gaggccggac cccgcccagg cagggagctg ctgtgagtcc ag 472

<210> 274
<211> 205
<212> DNA
<213> Homo sapien

<400> 274
ccaggcggcc cgaggactta cggtcggcac ttctctgttc tcccgtgtca gcgtgtggtg 60
tcgcctgcat gggtcgtacc tggatggtgt gtccaccatc gacacggagg ggctggattt 120
gtttctcagg caatcctgta ttttaatttt agatgtattt cctgaagcat atttttcata 180
gaatgtagcg tgtaaatagc ttttt 205

<210> 275
<211> 308
<212> DNA
<213> Homo sapien

<400> 275
ctcctcgccc tccccaccga catcatgctc cagttccagc ttggatttac actgggcaac 60
gtggttggaa tgtatctggc tcagaactat gatataccaa acctggctaa aaaacttgaa 120
gaaattaaaa aggacttgga tgccaagaag aaacccccta gtgcatgaga ctgcctccag 180
cactgccttc aggatatact gattctactg ctcttgaggg cctcgtttac tatctgaacc 240
aaaagctttt gttttcgtct ccagcctcag cacttctctt ctttgctaga ccctgtgttt 300
tttgcttt 308

<210> 276
<211> 201
<212> DNA
<213> Homo sapien

<400> 276
aaattaactt tttcttgcaa aatattcatt tcatttttc caagaaaatc ttataaaggc 60
aaaaataaaa ttttattttg gcaaatgtca tgaagtcgat actggcagca tatggagtta 120
gttaaaaata gacaacaact gctagatata ttcaaaattc tattttttt tctgagcata 180
gtcaaagaga aattttcatt t 201

<210> 277
<211> 520
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(520)
<223> n = A,T,C or G

<400> 277
aaaaaaaaag tattcagcac catttgctca tnggtctttc agagtttgtt cttaaagttt 60

ctggaacttt cctgtctgta aagtaacagg aattactgag ctacattgga aagcctctct 120
gggacaggca gtggggagtt aagcagtcat cataaaggaa tcagtgtaca ttcagcatgg 180
tgacttgact acacaacaat cccttcccct ctactgtagc tcaagagaga catgcttcta 240
accactgagg tatgaggagt ctcagactgt tatttgctgt tagaattggt cttcccagct 300
aataacagta catctctggc acagatgcta ttggtcctta atgtcctgtg attttaggaa 360
[illegible] 420
ctggcagagt aagggtatgc tggtttagta tctttataaa atatatataa tgtataggta 480
aatcatagtc ttaaatcata cctaaaatac tgtatcattt 520

<210> 278
<211> 264
<212> DNA
<213> Homo sapien

<400> 278
cgcgccgggc ggaactttcc agaacgctcg gtgagaggcg gaggagcggt aactaccccg 60
gctgcgcaca gctcggcgct ccttcccgct ccctcacaca ccggcctcag cccgcaccgg 120
cagtagaaga tggtgaaaga aacaacttac tacgatgttt tgggggtcaa acccaatgct 180
actcaggaag aattgaaaaa ggcttatagg aaactggcct tgaagtacca tcctgataag 240
aacccaaatg aaggagagaa gttt 264

<210> 279
<211> 414
<212> DNA
<213> Homo sapien

<400> 279
aaacatacaa taattttat tatggaaatt aatctttaca tacaaaatca gctacgtaat 60
tttacttaca aaacaataaa aactgttctt tactgtggca acaaaagaag cattttgaca 120
aatgaaaaaa attaatgcaa acaaattaaa acaatgcttt tctttttact tgcttcactg 180
tctcttctat ttattttcta tgatcatttg acacaaacat ggattacttt gatatctact 240
gaaacataaa tgataaggtt cttaaaggtt gaattaaaag tctgggtgtt caatatttta 300
gaagctgaat aaacaaaacg aaattggggt ttgtgattac agaggattta tcatttttc 360
cctttgtcca tatgaaaata tataatagaa aattacccac gggaaaacat tttt 414

<210> 280
<211> 262
<212> DNA
<213> Homo sapien

<400> 280
ccaccatgcc tggcctgctt caattttttg atgccacttt gtaaacggca cttaattatg 60
gaaaatagga aaaagcaaaa ctaaaataag gaagaggata tatatataac ttttcacaat 120
ctcttttctg atccccttta gatgcccagt caaccaggac cacacacaga tttcatttta 180
tttgtagagt atatgaaaag atttaatagt ctcatgcatt ttattttacg tatactgatt 240
tctacgtttt gactgactat tt 262

<210> 281
<211> 349
<212> DNA
<213> Homo sapien

<400> 281
ctgtgacccg ggtgcatcag tggatatagt tgtgtctccc catgggggtt taacagtctc 60
tgcccaagac cgttttctga taatggctgc agaaatggaa cagtcatctg gcacaggccc 120

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agcagaatta actcagtttt ggaaagaagt tcccagaaac aaagtgatgg aacataggtt      180
aagatgccat actgttgaaa gcagtaaacc aaacactctt acgttaaaag acaatgcttt      240
caatatgtca gataaaacca gtgaagatat atgtctacaa ctcagtcgtt tactagaaag      300
caataggaag cttgaagacc aagttcagcg ttgtatctgg ttccagcag                  349

      <210> 282
      <211> 381
      <212> DNA
      <213> Homo sapien

      <220>
      <221> misc_feature
      <222> (1)...(381)
      <223> n = A,T,C or G

      <400> 282
aaacactaaa tgaagcttct cacaatttct aattataaac aaaaggctga aaacagtatg       60
ggaaacaaag tttcaaaaca aagaaaagtt gagtaaaagg tgccccctct atggctcatc      120
tgaaagaaac attttactca gagaggcaaa catttctgat ctaggagtaa gtttcccact      180
cactttgcaa ggacccactc attctgcana aagacctaca agtctttctg gtctcaattg      240
caaagtacgt gaaaatgtgt atgaaagatc taaaagctaa atattagaat aaggctaatt      300
gaaatcaaaa ttgtgtgctg gtctaaatat acatcttcgg cttcttcctt tttagtaagt      360
atttttattt cagatgtatt t                                                381

      <210> 283
      <211> 543
      <212> DNA
      <213> Homo sapien

      <400> 283
aatatagctc ctccctaccc ccaacaatgg accctgccca ttgcctccca gttccttgat       60
cttcctaggt tccacaactc tctttttcct tttagtttta ttccctccag ccaaacctct      120
cttattcaat attttgagcc aatgggggag ttatgtagat ttttttccct acacattagc      180
tggccccttt tatgaccaat gactcataag gcaagatgtg tggtggcatc ttcggacagg      240
cagcaggctt taatagggca gcctgggttg gtggaggcaa gcaaagctaa ttggcatgcg      300
tgggaatcaa accccaggcc ctgggctcat tagcccatgg tcaaaacaac tgagccagag      360
gaggtaataa tttgcccaag aatatcagta gttcctttat tagaagaaaa tggctgatat      420
ggaagttggg gaatctgaat tgccagagaa tcttgggaag agtaataagc tcttagtctc      480
aacaaaaagt gtttttcat ctcagcgcgt aaagggtgct atatgggaac aaagaagtat       540
ttt                                                                    543

      <210> 284
      <211> 147
      <212> DNA
      <213> Homo sapien

      <400> 284
aaactggtat tttatctttg attctccttc agccctcacc cctggttctc atctttcttg       60
atcaacatct tttcttgcct ctgtcccctt ctctcatctc ttagctcccc tccaacctgg      120
ggggcagtgg tgtggagaag ccacagg                                          147

      <210> 285
      <211> 316
      <212> DNA
      <213> Homo sapien
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<400> 285
cggccgaggt ctggcttcac tcctactccc tctctgctcg cagcacgtcg gccgccagct 60
ctttgatgtg ttcccaggcc cgctgcacat gggcagattc caccgtgcga gaacagatgg 120
caaagcgcag gacaaacttg tccctgaggt gacatggaac caagtggatt tttttggcac 180
tgtttattct ttgcagaaga gcttcattca ctttgttgga accccttagc cgaaagcaga 240
caagccccag aatgacttcc acacagattt caaagcgggg atcctggcgc accagtgact 300
caaactcatg ggacag 316

<210> 286
<211> 322
<212> DNA
<213> Homo sapien

<400> 286
cctggggagc cctttagtgg ggtgggacct caggcagacc cccaaaccaa agggagccag 60
atgcccaagt tcaagtcatt agtgatatgt ggcagggctg acagagaaat aatcctggag 120
gtctccaaag ctgctgggaa tggaatggcg atgaaaagcg caggagtggg cagggtgtgg 180
tgggtgatgg tggcctcact cagagtggac caaggcccca gctccttgcc caaaaccaaa 240
gcccttgggc ccgaagtttt tagcataaca tcctttgcag taaatctcgc catccttgtc 300
tgccagggtg gttgactcaa gg 322

<210> 287
<211> 364
<212> DNA
<213> Homo sapien

<400> 287
ctgcccacgc tcaaaccaat tctggctgat atcgagtacc tgcaggacca gcacctcctg 60
ctcacagtca agtccatgga tggctatgaa tcctatgggg agtgtgtggt tgcactcaaa 120
tccatgatcg gcagcacggc ccaacagttc ctgaccttcc tatcccaccg tggcgaggag 180
acaggcaata tcagaggctc catgaaggtg cgggtgccca cggagcgcct gggcacccgt 240
gagcggctct acgagtggat cagcattgat aaggatgagg caggagcaaa gagcaaagcc 300
ccctctgtgt cccgagggag ccaggagccc aggtcaggga gccgcaagcc agccttcaca 360
gagg 364

<210> 288
<211> 261
<212> DNA
<213> Homo sapien

<400> 288
aaaattataa ctactcattc tttctttagc cttagttaat ttgagcagaa gccacaacaa 60
gcaaaccaca ataaatttag aattggcaga aatccacatt aactcctctt cccaagtttc 120
cacactacta ccatttacag ttgtaggttt gtaatgtata attatgtaat gcagaaacta 180
gctttgactt gtgtaacgat gcactgtcaa agtaagcaaa gtaagaattg aaattccaca 240
ttcccagaat ttaacactca g 261

<210> 289
<211> 261
<212> DNA
<213> Homo sapien

<400> 289
ctgagtgtta aattctggga atgtggaatt tcaattctta ctttgcttac tttgacagtg 60

catcgttaca caagtcaaag ctagtttctg cattacataa ttatacatta caaacctaca 120
actgtaaatg gtagtagtgt ggaaacttgg gaagaggagt taatgtggat ttctgccaat 180
tctaaattta ttgtggtttg cttgttgtgg cttctgctca aattaactaa ggctaaagaa 240
agaatgagta gttataattt t 261

<210> 290
<211> 92
<212> DNA
<213> Homo sapien

<400> 290
ccactacccg aacttacagg tgccaaaaga agaaagggta taaacggaga ccacctatca 60
ctcatcagaa cctaggatca tcacattcct tt 92

<210> 291
<211> 287
<212> DNA
<213> Homo sapien

<400> 291
ccatggctcc gctcagggcc ccggtcacct ccgagtcact ctgttccttg actgtctttg 60
tgtttctgta cctcaaggca ctgaagctgg aggactctgt ccatgcctgt gtcaccctcg 120
tgtgggagcc tctgggctcg gcaggtccac atttcatgag ctgaggcgtg ggccagggcc 180
atctggaaag ggaactcggc ttttccagaa cgtggtggat catctgtcgg gtgtgtggtg 240
aacacgttca gttcatcagg gcctacgctc cgggaagggg cccccag 287

<210> 292
<211> 270
<212> DNA
<213> Homo sapien

<400> 292
ccattgtttc ctcgctggcg aaggctcctt gaacatccct caccttcctc tcccgcctct 60
gccttctgct gggtcaaagg tggccttttc tctccagcct tgaattgttc cctgttggct 120
tcccaagggc ccatctgctg gtacagtcca cacttccaca gccaagaccc gagagggctt 180
tcactgcccc aagcctctct cctgtgaccc tgggattctg tcttggcaga atcctttgtc 240
agcggctctt actctgtcct tcctgtttgg 270

<210> 293
<211> 333
<212> DNA
<213> Homo sapien

<400> 293
ccatgctcgt caacctggtg tccactgctt gctacgtctc cttcctcttc ctgggctgcg 60
acactggccc tgtggctggg gttactgttc cctatggaaa cagcacagca cctggctcag 120
ccctggaccc ctactcgccc tgcaataata actgtgaatg ccaaaccgat tccttcactc 180
cagtgtgtgg ggcagatggc atcacctacc tgtctgcctg ctttgctggc tgcaacagca 240
cgaatctcac gggctgtgcg tgcctcacca ccgtccctgc tgagaacgca accgtggttc 300
ctggaaaatg ccccagtcct gggtgccaag agg 333

<210> 294
<211> 123
<212> DNA
<213> Homo sapien

<400> 294
ctgatacaaa tacagaaaac tctgcccatt atccaagaaa caaataatta agactaaaat 60
gcaagctgat gtgttgcagc attgtagggc cactaaatag ccatctgtga ttcgtggcaa 120
ttt 123

<210> 295
<211> 311
<212> DNA
<213> Homo sapien

<400> 295
ctgcatacag acatttgttt aggtcatctg gattatcttg attgtcacca tggcaactat 60
ccacaaccag tgcctaggtg tgtgagaaga gtgatacaat aatactgtgg catggtcatt 120
tagctaatcc agtctaagcc taacagaaac cttttccatc aaagtttttc agagaataac 180
aacatctcat aagaggccag aggatggctt gtgcttaata tcacacctgt acagtagggc 240
agtgcttccc aggctgtctg cttacatttt agcttgtctt acggttacat atggttttag 300
tattttcatt t 311

<210> 296
<211> 241
<212> DNA
<213> Homo sapien

<400> 296
ctgcggaaga tctgcaacca cccctacatg ttccagcaca tcgaggagtc cttttccgag 60
cacttggggt tcactggcgg cattgtccaa gggctggacc tgtaccgagc ctcgggtaaa 120
tttgagcttc ttgatagaat tcttcccaaa ctccgagcaa ccaaccacaa agtgctgctg 180
ttctgccaaa tgacctccct catgaccatc atggaagatt actttgcgta tcgcggcttt 240
a 241

<210> 297
<211> 295
<212> DNA
<213> Homo sapien

<400> 297
aaacacaaga tgaaaatact ctgttctgtc caaagcatca cctaatggtg tgaggcatct 60
cacttagctg tggagaagtc cttggaatta gatctcagaa agacagcttt aagacagtaa 120
aaccttttgg caatgggcta attgccttaa aagaagagtt ctacctgaaa gaccttgcag 180
gtggagaaat tgtcctacaa agattcttgg atatgttagt ggagataact gacatgggta 240
gctgtgggtc aaccaggaac tgtcaacaac ctgatctctg caaaaccagg atgga 295

<210> 298
<211> 347
<212> DNA
<213> Homo sapien

<400> 298
ccaaaataaa gcttcaggca agaggcaaag atccagtgga atatgggaga atggtggagg 60
accaacacct gctaccccag agagcttttc taaaaaaagc aagaaagcag tcatgagtgg 120
tattcaccct gcagaagaca cggaaggtac tgagtttgag ccagagggac ttccagaagt 180
tgtaaagaaa gggtttgctg acatcccgac aggaaagact agcccatata tcctgcgaag 240
aacaaccatg gcaactcgga ccagcccccg cctggctgca cagaagttag cgctatcccc 300
actgagtctc ggcaaagaaa atcttgcaga gtcctccaaa ccaacag 347

<210> 299
<211> 268
<212> DNA
<213> Homo sapien

<400> 299
aaaaagtaaa catgaaaaca tcacgaattg taccatgatt caagaataac ttttgtaata 60
gaaaacacat gaccttttgc agtatagtgt gataccgaag taaaagtgaa agaaataaat 120
gcaggaaagt ttaagtggat gtaagttttt ataaggaaag taataagagg aggctgcttt 180
tgaaggtcct ttgatcttcc atgatgataa tatcgttgca aagttcttta acttgtattc 240
aagtaattag cagttgacca cttggttt 268

<210> 300
<211> 185
<212> DNA
<213> Homo sapien

<400> 300
aaattggaga aggaagtttt cctgaagagc cagaatcctt gctaagtcat ttagatccaa 60
ctgaccatct ttatttctgt caaaaatctt catcatggtg ccggtgtatt cttccagttt 120
agcctcagaa atggcctttc tgtggtgaag aaagaggtct cggaggaagt tgcggagctc 180
agcag 185

<210> 301
<211> 75
<212> DNA
<213> Homo sapien

<400> 301
aaaattggaa agtgggataa gaaatctaaa gtaaccagct tatctttgaa acaatattat 60
tttgaaattg gcttt 75

<210> 302
<211> 247
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(247)
<223> n = A,T,C or G

<400> 302
ccatgttctc tgaattgggt gcagaagaca agggcagagt ggctgcggcc cctattacct 60
ttgtagcagc cacatcagaa agcagaagaa aacagtattt ctgaaggcat tgtttgaggt 120
tgatctcagc actgaacgat ttcaagccct acgcaccana acagaaggag ggtggaggaa 180
gtgatcanag ggaacgagct gtaggtttgc anaaatgtgt gaaaccaaaa tgatcactgc 240
ctacttg 247

<210> 303
<211> 535
<212> DNA
<213> Homo sapien

<400> 303
ctgcttcaga ggaaatcact gaaaaataaa gaaaaaccat ccatgcatgg ctgcatccag 60
tgtacctgta atcctgaaga aaaggtccta attccttcca tgctgaaatg ctagctttgg 120
tttcagagag agactttatt gcaactgtga ccaccgtcac tggtgagcac tgctgttcgg 180
cccccagcgg acttaaaaga ctggaatgtg gtagtggcgg tcgttctcgg tcagcaggga 240
[illegible] 300
aaacttgaac agtctgaaca cttttatctt tacttcaagg gagtatccaa gtataaacat 360
atcaatctgc tctagtccac atgtgtcgcc tacagaattc aggtgattca tcatgaagct 420
caaaggatca gaggatgtct ccctggaaaa caggagtcta aaaagactgg gaatgacctt 480
tttagtcttc atttgttcat aaacttcagt gacttgatac agcatgatga acttt 535

<210> 304
<211> 522
<212> DNA
<213> Homo sapien

<400> 304
ccgcgctcgg tctacaatca cgttttatta ttggctcgtc tagtcatggg atagagaagg 60
taaatagcaa aatagaaaga aaagggggaa aaggtagaag gcaaggggaa aactattggt 120
tttagatctt tatcctggtc ctgtcaatga tcaggtaatt ggaaggatca aaattaggcc 180
aaacttggta attgggccaa aattgaacca aagtttgtgt caagaagacc tggggcagag 240
atatgtgact aaatcatttg gaatatgccc agaccccaag aatatttatg cccaacttga 300
atgctaacca gaagtccctt actgtagaag attgtaaggt tgctattttt ttgccccgac 360
accaaaatat tgatgtattt tccaacacca attctccaat tctctgacac caactcgatg 420
ttcaacaatt cagttatatt ctgtcactaa ttcctgcagc tatcagcagg ccccacaggt 480
aaaggattca gtctcacaag attgcccccc cacccacttc ag 522

<210> 305
<211> 165
<212> DNA
<213> Homo sapien

<400> 305
cctaaagcgc tcctcgctga agctcaaggg gtccacaatg atttgtttgt caaagttatt 60
gagtgcatat gccagttctc ctcctcctcc accctggtgc tgtgaggcat cgtctgaggc 120
agtggcctgg gctgcattgg aaatgcctgt gaccgcctgc tgcag 165

<210> 306
<211> 294
<212> DNA
<213> Homo sapien

<400> 306
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<211> 181
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<213> Homo sapien

<400> 307

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<213> Homo sapien

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<223> n = A,T,C or G

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<210> 309
<211> 129
<212> DNA
<213> Homo sapien

<220>
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<222> (1)...(129)
<223> n = A,T,C or G

<400> 309
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<210> 310
<211> 390
<212> DNA
<213> Homo sapien

<400> 310
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<211> 355
<212> DNA
<213> Homo sapien

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<211> 498
<212> DNA
<213> Homo sapien

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<211> 653
<212> DNA
<213> Homo sapien

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<212> DNA
<213> Homo sapien

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<212> DNA
<213> Homo sapien

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<210> 316
<211> 1633
<212> DNA
<213> Homo sapiens

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<211> 4235
<212> DNA
<213> Homo sapiens

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<213> Homo sapiens

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<210> 319
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<212> DNA
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<400> 319

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<213> Homo sapiens

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<212> DNA
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<211> 200
<212> PRT
<213> Homo sapiens

<400> 324

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Glu Val Pro Val Asn Phe Ala Glu Phe Ser Lys Lys Cys Ser Glu Arg
        35                  40                  45

Trp Lys Thr Val Ser Gly Lys Glu Lys Ser Lys Phe Asp Glu Met Ala
    50                  55                  60

Lys Ala Asp Lys Val Arg Tyr Asp Arg Glu Met Lys Asp Tyr Gly Pro
65                  70                  75                  80

Ala Lys Gly Gly Lys Lys Lys Lys Asp Pro Asn Ala Pro Lys Arg Pro
                85                  90                  95

Pro Ser Gly Phe Phe Leu Phe Cys Ser Glu Phe Arg Pro Lys Ile Lys
            100                 105                 110

Ser Thr Asn Pro Gly Ile Ser Ile Gly Asp Val Ala Lys Lys Leu Gly
        115                 120                 125

Glu Met Trp Asn Asn Leu Asn Asp Ser Glu Lys Gln Pro Tyr Ile Thr
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Lys Ala Ala Lys Leu Lys Glu Lys Tyr Glu Lys Asp Val Ala Asp Tyr
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Lys Ser Lys Gly Lys Phe Asp Gly Ala Lys Gly Pro Ala Lys Val Ala
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Arg Lys Lys Val Glu Glu Glu Asp Glu Glu Gln Glu Glu Glu Glu Glu
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Glu Glu Glu Glu Glu Glu Asp Glu
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<212> PRT
<213> Homo sapiens

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Ser Ala Thr Val Gly Leu Lys Ser Lys Thr His Ala Val Leu Val Ala
        35                  40                  45

Leu Lys Arg Ala Gln Ser Glu Leu Ala Ala His Gln Lys Lys Ile Leu
    50                  55                  60

His Val Asp Asn His Ile Gly Ile Ser Ile Ala Gly Leu Thr Ala Asp
65                  70                  75                  80

Ala Arg Leu Leu Cys Asn Phe Met Arg Gln Glu Cys Leu Asp Ser Arg
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Phe Val Phe Asp Arg Pro Leu Pro Val Ser Arg Leu Val Ser Leu Ile
            100                 105                 110

Gly Ser Lys Thr Gln Ile Pro Thr Gln Arg Tyr Gly Arg Arg Pro Tyr
        115                 120                 125

Gly Val Gly Leu Leu Ile Ala Gly Tyr Asp Asp Met Gly Pro His Ile
    130                 135                 140

Phe Gln Thr Cys Pro Ser Ala Asn Tyr Phe Asp Cys Arg Ala Met Ser
145                 150                 155                 160

Ile Gly Ala Arg Ser Gln Ser Ala Arg Thr Tyr Leu Glu Arg His Met
                165                 170                 175

Ser Glu Phe Met Glu Cys Asn Leu Asn Glu Leu Val Lys His Gly Leu
            180                 185                 190

Arg Ala Leu Arg Glu Thr Leu Pro Ala Glu Gln Asp Leu Thr Thr Lys
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Asn Val Ser Ile Gly Ile Val Gly Lys Asp Leu Glu Phe Thr Ile Tyr
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210 215 220

Asp Asp Asp Asp Val Ser Pro Phe Leu Glu Gly Leu Glu Glu Arg Pro
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Gln Arg Lys Ala Gln Pro Ala Gln Pro Ala Asp Glu Pro Ala Glu Lys
245 250 255

Ala Asp Glu Pro Met Glu His
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<210> 326
<211> 539
<212> PRT
<213> Homo sapiens

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Ile Arg Phe Ser Asn Ile Ser Ala Ala Lys Ala Val Ala Asp Ala Ile
35 40 45

Arg Thr Ser Leu Gly Pro Lys Gly Met Asp Lys Met Ile Gln Asp Gly
50 55 60

Lys Gly Asp Val Thr Ile Thr Asn Asp Gly Ala Thr Ile Leu Lys Gln
65 70 75 80

Met Gln Val Leu His Pro Ala Ala Arg Met Leu Val Glu Leu Ser Lys
85 90 95

Ala Gln Asp Ile Glu Ala Gly Asp Gly Thr Thr Ser Val Val Ile Ile
100 105 110

Ala Gly Ser Leu Leu Asp Ser Cys Thr Lys Leu Leu Gln Lys Gly Ile
115 120 125

His Pro Thr Ile Ile Ser Glu Ser Phe Gln Lys Ala Leu Glu Lys Gly
130 135 140

Ile Glu Ile Leu Thr Asp Met Ser Arg Pro Val Glu Leu Ser Asp Arg
145 150 155 160

Glu Thr Leu Leu Asn Ser Ala Thr Thr Ser Leu Asn Ser Lys Val Val
165 170 175

Ser Gln Tyr Ser Ser Leu Leu Ser Pro Met Ser Val Asn Ala Val Met
180 185 190

Lys Val Ile Asp Pro Ala Thr Ala Thr Ser Val Asp Leu Arg Asp Ile

195 200 205

Lys Ile Val Lys Lys Leu Gly Gly Thr Ile Asp Asp Cys Glu Leu Val
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Glu Gly Leu Val Leu Thr Gln Lys Val Ser Asn Ser Gly Ile Thr Arg
225 230 235 240

Val Glu Lys Ala Lys Ile Gly Leu Ile Gln Phe Cys Leu Ser Ala Pro
245 250 255

Lys Thr Asp Met Asp Asn Gln Ile Val Val Ser Asp Tyr Ala Gln Met
260 265 270

Asp Arg Val Leu Arg Glu Glu Arg Ala Tyr Ile Leu Asn Leu Val Lys
275 280 285

Gln Ile Lys Lys Thr Gly Cys Asn Val Leu Leu Ile Gln Lys Ser Ile
290 295 300

Leu Arg Asp Ala Leu Ser Asp Leu Ala Leu His Phe Leu Asn Lys Met
305 310 315 320

Lys Ile Met Val Ile Lys Asp Ile Glu Arg Glu Asp Ile Glu Phe Ile
325 330 335

Cys Lys Thr Ile Gly Thr Lys Pro Val Ala His Ile Asp Gln Phe Thr
340 345 350

Ala Asp Met Leu Gly Ser Ala Glu Leu Ala Glu Glu Val Asn Leu Asn
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Gly Ser Gly Lys Leu Leu Lys Ile Thr Gly Cys Ala Ser Pro Gly Lys
370 375 380

Thr Val Thr Ile Val Val Arg Gly Ser Asn Lys Leu Val Ile Glu Glu
385 390 395 400

Ala Glu Arg Ser Ile His Asp Ala Leu Cys Val Ile Arg Cys Leu Val
405 410 415

Lys Lys Arg Ala Leu Ile Ala Gly Gly Gly Ala Pro Glu Ile Glu Leu
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Tyr Cys Val Arg Ala Phe Ala Asp Ala Met Glu Val Ile Pro Ser Thr
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485 490 495

Lys Gly Gly Ile Ser Asn Ile Leu Glu Glu Leu Val Val Gln Pro Leu
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<211> 144
<212> PRT
<213> Homo sapiens

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Glu Leu Lys Thr Asp Tyr Lys Asn Pro Ile Asp Gln Cys Asn Thr Leu
35 40 45

Asn Pro Leu Val Leu Pro Glu Tyr Leu Ile His Ala Phe Phe Cys Val
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Met Phe Leu Cys Ala Ala Glu Trp Leu Thr Leu Gly Leu Asn Met Pro
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Leu Leu Ala Tyr His Ile Trp Arg Tyr Met Ser Arg Pro Val Met Ser
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Gly Pro Gly Leu Tyr Asp Pro Thr Thr Ile Met Asn Ala Asp Ile Leu
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Ala Phe Phe Tyr Tyr Leu Tyr Gly Met Ile Tyr Val Leu Val Ser Ser
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<212> PRT
<213> Homo sapiens

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Glu Glu Leu Leu Lys Val Leu Gly Val Asn Val Met Leu Arg Lys Ile

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Ala Val Ala Ala Ala Ser Lys Pro Ala Val Glu Ile Lys Gln Glu Gly
35 40 45

Asp Thr Phe Tyr Ile Lys Thr Ser Thr Thr Val Arg Thr Thr Glu Ile
50 55 60

Asn Phe Lys Val Gly Glu Glu Phe Glu Glu Gln Thr Val Asp Gly Arg
65 70 75 80

Pro Cys Lys Ser Leu Val Lys Trp Glu Ser Glu Asn Lys Met Val Cys
85 90 95

Glu Gln Lys Leu Leu Lys Gly Glu Gly Pro Lys Thr Ser Trp Thr Arg
100 105 110

Glu Leu Thr Asn Asp Gly Glu Leu Ile Leu Thr Met Thr Ala Asp Asp
115 120 125

Val Val Cys Thr Arg Val Tyr Val Arg Glu
130 135

<210> 329
<211> 346
<212> PRT
<213> Homo sapiens

<400> 329
Met Phe Leu Ser Ile Leu Val Ala Leu Cys Leu Trp Leu His Leu Ala
5 10 15

Leu Gly Val Arg Gly Ala Pro Cys Glu Ala Val Arg Ile Pro Met Cys
20 25 30

Arg His Met Pro Trp Asn Ile Thr Arg Met Pro Asn His Leu His His
35 40 45

Ser Thr Gln Glu Asn Ala Ile Leu Ala Ile Glu Gln Tyr Glu Glu Leu
50 55 60

Val Asp Val Asn Cys Ser Ala Val Leu Arg Phe Phe Phe Cys Ala Met
65 70 75 80

Tyr Ala Pro Ile Cys Thr Leu Glu Phe Leu His Asp Pro Ile Lys Pro
85 90 95

Cys Lys Ser Val Cys Gln Arg Ala Arg Asp Asp Cys Glu Pro Leu Met
100 105 110

Lys Met Tyr Asn His Ser Trp Pro Glu Ser Leu Ala Cys Asp Glu Leu
115 120 125

Pro Val Tyr Asp Arg Gly Val Cys Ile Ser Pro Glu Ala Ile Val Thr

130 135 140

Asp Leu Pro Glu Asp Val Lys Trp Ile Asp Ile Thr Pro Asp Met Met
145 150 155 160

Val Gln Glu Arg Pro Leu Asp Val Asp Cys Lys Arg Leu Ser Pro Asp
165 170 175

Arg Cys Lys Cys Lys Lys Val Lys Pro Thr Leu Ala Thr Tyr Leu Ser
180 185 190

Lys Asn Tyr Ser Tyr Val Ile His Ala Lys Ile Lys Ala Val Gln Arg
195 200 205

Ser Gly Cys Asn Glu Val Thr Thr Val Val Asp Val Lys Glu Ile Phe
210 215 220

Lys Ser Ser Ser Pro Ile Pro Arg Thr Gln Val Pro Leu Ile Thr Asn
225 230 235 240

Ser Ser Cys Gln Cys Pro His Ile Leu Pro His Gln Asp Val Leu Ile
245 250 255

Met Cys Tyr Glu Trp Arg Ser Arg Met Met Leu Leu Glu Asn Cys Leu
260 265 270

Val Glu Lys Trp Arg Asp Gln Leu Ser Lys Arg Ser Ile Gln Trp Glu
275 280 285

Glu Arg Leu Gln Glu Gln Arg Arg Thr Val Gln Asp Lys Lys Lys Thr
290 295 300

Ala Gly Arg Thr Ser Arg Ser Asn Pro Pro Lys Pro Lys Gly Lys Pro
305 310 315 320

Pro Ala Pro Lys Pro Ala Ser Pro Lys Lys Asn Ile Lys Thr Arg Ser
325 330 335

Ala Gln Lys Arg Thr Asn Pro Lys Arg Val
340 345

<210> 330
<211> 826
<212> PRT
<213> Homo sapiens

<400> 330
Met Glu Gly Ala Gly Gly Ala Asn Asp Lys Lys Lys Ile Ser Ser Glu
5 10 15

Arg Arg Lys Glu Lys Ser Arg Asp Ala Ala Arg Ser Arg Arg Ser Lys
20 25 30

Glu Ser Glu Val Phe Tyr Glu Leu Ala His Gln Leu Pro Leu Pro His

35 40 45

Asn Val Ser Ser His Leu Asp Lys Ala Ser Val Met Arg Leu Thr Ile
50 55 60

Ser Tyr Leu Arg Val Arg Lys Leu Leu Asp Ala Gly Asp Leu Asp Ile
65 70 75 80

Glu Asp Asp Met Lys Ala Gln Met Asn Cys Phe Tyr Leu Lys Ala Leu
85 90 95

Asp Gly Phe Val Met Val Leu Thr Asp Asp Gly Asp Met Ile Tyr Ile
100 105 110

Ser Asp Asn Val Asn Lys Tyr Met Gly Leu Thr Gln Phe Glu Leu Thr
115 120 125

Gly His Ser Val Phe Asp Phe Thr His Pro Cys Asp His Glu Glu Met
130 135 140

Arg Glu Met Leu Thr His Arg Asn Gly Leu Val Lys Lys Gly Lys Glu
145 150 155 160

Gln Asn Thr Gln Arg Ser Phe Phe Leu Arg Met Lys Cys Thr Leu Thr
165 170 175

Ser Arg Gly Arg Thr Met Asn Ile Lys Ser Ala Thr Trp Lys Val Leu
180 185 190

His Cys Thr Gly His Ile His Val Tyr Asp Thr Asn Ser Asn Gln Pro
195 200 205

Gln Cys Gly Tyr Lys Lys Pro Pro Met Thr Cys Leu Val Leu Ile Cys
210 215 220

Glu Pro Ile Pro His Pro Ser Asn Ile Glu Ile Pro Leu Asp Ser Lys
225 230 235 240

Thr Phe Leu Ser Arg His Ser Leu Asp Met Lys Phe Ser Tyr Cys Asp
245 250 255

Glu Arg Ile Thr Glu Leu Met Gly Tyr Glu Pro Glu Glu Leu Leu Gly
260 265 270

Arg Ser Ile Tyr Glu Tyr Tyr His Ala Leu Asp Ser Asp His Leu Thr
275 280 285

Lys Thr His His Asp Met Phe Thr Lys Gly Gln Val Thr Thr Gly Gln
290 295 300

Tyr Arg Met Leu Ala Lys Arg Gly Gly Tyr Val Trp Val Glu Thr Gln
305 310 315 320

Ala Thr Val Ile Tyr Asn Thr Lys Asn Ser Gln Pro Gln Cys Ile Val
325 330 335

Cys Val Asn Tyr Val Val Ser Gly Ile Ile Gln His Asp Leu Ile Phe
340 345 350

Ser Leu Gln Gln Thr Glu Cys Val Leu Lys Pro Val Glu Ser Ser Asp
355 360 365

Met Lys Met Thr Gln Leu Phe Thr Lys Val Glu Ser Glu Asp Thr Ser
370 375 380

Ser Leu Phe Asp Lys Leu Lys Lys Glu Pro Asp Ala Leu Thr Leu Leu
385 390 395 400

Ala Pro Ala Ala Gly Asp Thr Ile Ile Ser Leu Asp Phe Gly Ser Asn
405 410 415

Asp Thr Glu Thr Asp Asp Gln Gln Leu Glu Glu Val Pro Leu Tyr Asn
420 425 430

Asp Val Met Leu Pro Ser Pro Asn Glu Lys Leu Gln Asn Ile Asn Leu
435 440 445

Ala Met Ser Pro Leu Pro Thr Ala Glu Thr Pro Lys Pro Leu Arg Ser
450 455 460

Ser Ala Asp Pro Ala Leu Asn Gln Glu Val Ala Leu Lys Leu Glu Pro
465 470 475 480

Asn Pro Glu Ser Leu Glu Leu Ser Phe Thr Met Pro Gln Ile Gln Asp
485 490 495

Gln Thr Pro Ser Pro Ser Asp Gly Ser Thr Arg Gln Ser Ser Pro Glu
500 505 510

Pro Asn Ser Pro Ser Glu Tyr Cys Phe Tyr Val Asp Ser Asp Met Val
515 520 525

Asn Glu Phe Lys Leu Glu Leu Val Glu Lys Leu Phe Ala Glu Asp Thr
530 535 540

Glu Ala Lys Asn Pro Phe Ser Thr Gln Asp Thr Asp Leu Asp Leu Glu
545 550 555 560

Met Leu Ala Pro Tyr Ile Pro Met Asp Asp Asp Phe Gln Leu Arg Ser
565 570 575

Phe Asp Gln Leu Ser Pro Leu Glu Ser Ser Ser Ala Ser Pro Glu Ser
580 585 590

Ala Ser Pro Gln Ser Thr Val Thr Val Phe Gln Gln Thr Gln Ile Gln
595 600 605

Glu Pro Thr Ala Asn Ala Thr Thr Thr Thr Ala Thr Thr Asp Glu Leu
610 615 620

Lys Thr Val Thr Lys Asp Arg Met Glu Asp Ile Lys Ile Leu Ile Ala
625 630 635 640

Ser Pro Ser Pro Thr His Ile His Lys Glu Thr Thr Ser Ala Thr Ser
645 650 655

Ser Pro Tyr Arg Asp Thr Gln Ser Arg Thr Ala Ser Pro Asn Arg Ala
660 665 670

Gly Lys Gly Val Ile Glu Gln Thr Glu Lys Ser His Pro Arg Ser Pro
675 680 685

Asn Val Leu Ser Val Ala Leu Ser Gln Arg Thr Thr Val Pro Glu Glu
690 695 700

Glu Leu Asn Pro Lys Ile Leu Ala Leu Gln Asn Ala Gln Arg Lys Arg
705 710 715 720

Lys Met Glu His Asp Gly Ser Leu Phe Gln Ala Val Gly Ile Gly Thr
725 730 735

Leu Leu Gln Gln Pro Asp Asp His Ala Ala Thr Thr Ser Leu Ser Trp
740 745 750

Lys Arg Val Lys Gly Cys Lys Ser Ser Glu Gln Asn Gly Met Glu Gln
755 760 765

Lys Thr Ile Ile Leu Ile Pro Ser Asp Leu Ala Cys Arg Leu Leu Gly
770 775 780

Gln Ser Met Asp Glu Ser Gly Leu Pro Gln Leu Thr Ser Tyr Asp Cys
785 790 795 800

Glu Val Asn Ala Pro Ile Gln Gly Ser Arg Asn Leu Leu Gln Gly Glu
805 810 815

Glu Leu Leu Arg Ala Leu Asp Gln Val Asn
820 825

<210> 331
<211> 92
<212> PRT
<213> Homo sapiens

<400> 331
Met Ala Tyr Arg Gly Gln Gly Gln Lys Val Gln Lys Val Met Val Gln
5 10 15

Pro Ile Asn Leu Ile Phe Arg Tyr Leu Gln Asn Arg Ser Arg Ile Gln
20 25 30

Val Trp Leu Tyr Glu Gln Val Asn Met Arg Ile Glu Gly Cys Ile Ile
35 40 45

Gly Phe Asp Glu Tyr Met Asn Leu Val Leu Asp Asp Ala Glu Glu Ile
50 55 60

His Ser Lys Thr Lys Ser Arg Lys Gln Leu Gly Arg Ile Met Leu Lys
65 70 75 80

Gly Asp Asn Ile Thr Leu Leu Gln Ser Val Ser Asn
85 90

<210> 332
<211> 235
<212> PRT
<213> Homo sapiens

<400> 332
Met Asp Pro Ala Arg Pro Leu Gly Leu Ser Ile Leu Leu Leu Phe Leu
5 10 15

Thr Glu Ala Ala Leu Gly Asp Ala Ala Gln Glu Pro Thr Gly Asn Asn
20 25 30

Ala Glu Ile Cys Leu Leu Pro Leu Asp Tyr Gly Pro Cys Arg Ala Leu
35 40 45

Leu Leu Arg Tyr Tyr Tyr Asp Arg Tyr Thr Gln Ser Cys Arg Gln Phe
50 55 60

Leu Tyr Gly Gly Cys Glu Gly Asn Ala Asn Asn Phe Tyr Thr Trp Glu
65 70 75 80

Ala Cys Asp Asp Ala Cys Trp Arg Ile Glu Lys Val Pro Lys Val Cys
85 90 95

Arg Leu Gln Val Ser Val Asp Asp Gln Cys Glu Gly Ser Thr Glu Lys
100 105 110

Tyr Phe Phe Asn Leu Ser Ser Met Thr Cys Glu Lys Phe Phe Ser Gly
115 120 125

Gly Cys His Arg Asn Arg Ile Glu Asn Arg Phe Pro Asp Glu Ala Thr
130 135 140
Cys Met Gly Phe Cys Ala Pro Lys Lys Ile Pro Ser Phe Cys Tyr Ser
145 150 155 160

Pro Lys Asp Glu Gly Leu Cys Ser Ala Asn Val Thr Arg Tyr Tyr Phe
165 170 175

Asn Pro Arg Tyr Arg Thr Cys Asp Ala Phe Thr Tyr Thr Gly Cys Gly
180 185 190

Gly Asn Asp Asn Asn Phe Val Ser Arg Glu Asp Cys Lys Arg Ala Cys
195 200 205

Ala Lys Ala Leu Lys Lys Lys Lys Lys Met Pro Lys Leu Arg Phe Ala

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    210                 215                 220

Ser Arg Ile Arg Lys Ile Arg Lys Lys Gln Phe
225                 230                 235


<210> 333
<211> 291
<212> PRT
<213> Homo sapiens

<400> 333
Met Gln Arg Ala Arg Pro Thr Leu Trp Ala Ala Ala Leu Thr Leu Leu
                5                   10                  15

Val Leu Leu Arg Gly Pro Pro Val Ala Arg Ala Gly Ala Ser Ser Gly
            20                  25                  30

Gly Leu Gly Pro Val Val Arg Cys Glu Pro Cys Asp Ala Arg Ala Leu
        35                  40                  45

Ala Gln Cys Ala Pro Pro Pro Ala Val Cys Ala Glu Leu Val Arg Glu
    50                  55                  60

Pro Gly Cys Gly Cys Cys Leu Thr Cys Ala Leu Ser Glu Gly Gln Pro
65                  70                  75                  80

Cys Gly Ile Tyr Thr Glu Arg Cys Gly Ser Gly Leu Arg Cys Gln Pro
                85                  90                  95

Ser Pro Asp Glu Ala Arg Pro Leu Gln Ala Leu Leu Asp Gly Arg Gly
            100                 105                 110

Leu Cys Val Asn Ala Ser Ala Val Ser Arg Leu Arg Ala Tyr Leu Leu
        115                 120                 125

Pro Ala Pro Pro Ala Pro Gly Asn Ala Ser Glu Ser Glu Glu Asp Arg
    130                 135                 140

Ser Ala Gly Ser Val Glu Ser Pro Ser Val Ser Ser Thr His Arg Val
145                 150                 155                 160

Ser Asp Pro Lys Phe His Pro Leu His Ser Lys Ile Ile Ile Ile Lys
                165                 170                 175

Lys Gly His Ala Lys Asp Ser Gln Arg Tyr Lys Val Asp Tyr Glu Ser
            180                 185                 190

Gln Ser Thr Asp Thr Gln Asn Phe Ser Ser Glu Ser Lys Arg Glu Thr
        195                 200                 205

Glu Tyr Gly Pro Cys Arg Arg Glu Met Glu Asp Thr Leu Asn His Leu
    210                 215                 220

Lys Phe Leu Asn Val Leu Ser Pro Arg Gly Val His Ile Pro Asn Cys
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225 230 235 240

Asp Lys Lys Gly Phe Tyr Lys Lys Lys Gln Cys Arg Pro Ser Lys Gly
245 250 255

Arg Lys Arg Gly Phe Cys Trp Cys Val Asp Lys Tyr Gly Gln Pro Leu
260 265 270

Pro Gly Tyr Thr Thr Lys Gly Lys Glu Asp Val His Cys Tyr Ser Met
275 280 285

Gln Ser Lys
290

<210> 334
<211> 582
<212> PRT
<213> Homo sapiens

<400> 334
Glu Ser Lys Gly Ala Ser Ser Cys Arg Leu Leu Phe Cys Leu Leu Ile
5 10 15

Ser Ala Thr Val Phe Arg Pro Gly Leu Gly Trp Tyr Thr Val Asn Ser
20 25 30

Ala Tyr Gly Asp Thr Ile Ile Ile Pro Cys Arg Leu Asp Val Pro Gln
35 40 45

Asn Leu Met Phe Gly Lys Trp Lys Tyr Glu Lys Pro Asp Gly Ser Pro
50 55 60

Val Phe Ile Ala Phe Arg Ser Ser Thr Lys Lys Ser Val Gln Tyr Asp
65 70 75 80

Asp Val Pro Glu Tyr Lys Asp Arg Leu Asn Leu Ser Glu Asn Tyr Thr
85 90 95

Leu Ser Ile Ser Asn Ala Arg Ile Ser Asp Glu Lys Arg Phe Val Cys
100 105 110

Met Leu Val Thr Glu Asp Asn Val Phe Glu Ala Pro Thr Ile Val Lys
115 120 125

Val Phe Lys Gln Pro Ser Lys Pro Glu Ile Val Ser Lys Ala Leu Phe
130 135 140

Leu Glu Thr Glu Gln Leu Lys Lys Leu Gly Asp Cys Ile Ser Glu Asp
145 150 155 160

Ser Tyr Pro Asp Gly Asn Ile Thr Trp Tyr Arg Asn Gly Lys Val Leu
165 170 175

His Pro Leu Glu Gly Ala Val Val Ile Ile Phe Lys Lys Glu Met Asp

180 185 190

Pro Val Thr Gln Leu Tyr Thr Met Thr Ser Thr Leu Glu Tyr Lys Thr
195 200 205

Thr Lys Ala Asp Ile Gln Met Pro Phe Thr Cys Ser Val Thr Tyr Tyr
210 215 220

Gly Pro Ser Gly Gln Lys Thr Ile His Ser Glu Gln Ala Val Phe Asp
225 230 235 240

Ile Tyr Tyr Pro Thr Glu Gln Val Thr Ile Gln Val Leu Pro Pro Lys
245 250 255

Asn Ala Ile Lys Glu Gly Asp Asn Ile Thr Leu Lys Cys Leu Gly Asn
260 265 270

Gly Asn Pro Pro Pro Glu Glu Phe Leu Phe Tyr Leu Pro Gly Gln Pro
275 280 285

Glu Gly Ile Arg Ser Ser Asn Thr Tyr Thr Leu Thr Asp Val Arg Arg
290 295 300

Asn Ala Thr Gly Asp Tyr Lys Cys Ser Leu Ile Asp Lys Lys Ser Met
305 310 315 320

Ile Ala Ser Thr Ala Ile Thr Val His Tyr Leu Asp Leu Ser Leu Asn
325 330 335

Pro Ser Gly Glu Val Thr Arg Gln Ile Gly Asp Ala Leu Pro Val Ser
340 345 350

Cys Thr Ile Ser Ala Ser Arg Asn Ala Thr Val Val Trp Met Lys Asp
355 360 365

Asn Ile Arg Leu Arg Ser Ser Pro Ser Phe Ser Ser Leu His Tyr Gln
370 375 380

Asp Ala Gly Asn Tyr Val Cys Glu Thr Ala Leu Gln Glu Val Glu Gly
385 390 395 400

Leu Lys Lys Arg Glu Ser Leu Thr Leu Ile Val Glu Gly Lys Pro Gln
405 410 415

Ile Lys Met Thr Lys Lys Thr Asp Pro Ser Gly Leu Ser Lys Thr Ile
420 425 430

Ile Cys His Val Glu Gly Phe Pro Lys Pro Ala Ile Gln Trp Thr Ile
435 440 445

Thr Gly Ser Gly Ser Val Ile Asn Gln Thr Glu Glu Ser Pro Tyr Ile
450 455 460

Asn Gly Arg Tyr Tyr Ser Lys Ile Ile Ile Ser Pro Glu Glu Asn Val
465 470 475 480

Thr Leu Thr Cys Thr Ala Glu Asn Gln Leu Glu Arg Thr Val Asn Ser
485 490 495

Leu Asn Val Ser Ala Ile Ser Ile Pro Glu His Asp Glu Ala Asp Glu
500 505 510

Ile Ser Asp Glu Asn Arg Glu Lys Val Asn Asp Gln Ala Lys Leu Ile
515 520 525

Val Gly Ile Val Val Gly Leu Leu Leu Ala Ala Leu Val Ala Gly Val
530 535 540

Val Tyr Trp Leu Tyr Met Lys Lys Ser Lys Thr Ala Ser Lys His Val
545 550 555 560

Asn Lys Asp Leu Gly Asn Met Glu Glu Asn Lys Lys Leu Glu Glu Asn
565 570 575

Asn His Lys Thr Glu Ala
580

<210> 335
<211> 709
<212> PRT
<213> Homo sapiens

<400> 335
Met Ala Glu Val Glu Asp Gln Ala Ala Arg Asp Met Lys Arg Leu Glu
5 10 15

Glu Lys Asp Lys Glu Arg Lys Asn Val Lys Gly Ile Arg Asp Asp Ile
20 25 30

Glu Glu Glu Asp Asp Gln Glu Ala Tyr Phe Arg Tyr Met Ala Glu Asn
35 40 45

Pro Thr Ala Gly Val Val Gln Glu Glu Glu Glu Asp Asn Leu Glu Tyr
50 55 60

Asp Ser Asp Gly Asn Pro Ile Ala Pro Thr Lys Lys Ile Ile Asp Pro
65 70 75 80

Leu Pro Pro Ile Asp His Ser Glu Ile Asp Tyr Pro Pro Phe Glu Lys
85 90 95

Asn Phe Tyr Asn Glu His Glu Glu Ile Thr Asn Leu Thr Pro Gln Gln
100 105 110

Leu Ile Asp Leu Arg His Lys Leu Asn Leu Arg Val Ser Gly Ala Ala
115 120 125

Pro Pro Arg Pro Gly Ser Ser Phe Ala His Phe Gly Phe Asp Glu Gln
130 135 140

Leu Met His Gln Ile Arg Lys Ser Glu Tyr Thr Gln Pro Thr Pro Ile
145 150 155 160

Gln Cys Gln Gly Val Pro Val Ala Leu Ser Gly Arg Asp Met Ile Gly
165 170 175

Ile Ala Lys Thr Gly Ser Gly Lys Thr Ala Ala Phe Ile Trp Pro Met
180 185 190

Leu Ile His Ile Met Asp Gln Lys Glu Leu Glu Pro Gly Asp Gly Pro
195 200 205

Ile Ala Val Ile Val Cys Pro Thr Arg Glu Leu Cys Gln Gln Ile His
210 215 220

Ala Glu Cys Lys Arg Phe Gly Lys Ala Tyr Asn Leu Arg Ser Val Ala
225 230 235 240

Val Tyr Gly Gly Gly Ser Met Trp Glu Gln Ala Lys Ala Leu Gln Glu
245 250 255

Gly Ala Glu Ile Val Val Cys Thr Pro Gly Arg Leu Ile Asp His Val
260 265 270

Lys Lys Lys Ala Thr Asn Leu Gln Arg Val Ser Tyr Leu Val Phe Asp
275 280 285

Glu Ala Asp Arg Met Phe Asp Met Gly Phe Glu Tyr Gln Val Arg Ser
290 295 300

Ile Ala Ser His Val Arg Pro Asp Arg Gln Thr Leu Leu Phe Ser Ala
305 310 315 320

Thr Phe Arg Lys Lys Ile Glu Lys Leu Ala Arg Asp Ile Leu Ile Asp
325 330 335

Pro Ile Arg Val Val Gln Gly Asp Ile Gly Glu Ala Asn Glu Asp Val
340 345 350

Thr Gln Ile Val Glu Ile Leu His Ser Gly Pro Ser Lys Trp Asn Trp
355 360 365

Leu Thr Arg Arg Leu Val Glu Phe Thr Ser Ser Gly Ser Val Leu Leu
370 375 380

Phe Val Thr Lys Lys Ala Asn Ala Glu Glu Leu Ala Asn Asn Leu Lys
385 390 395 400

Gln Glu Gly His Asn Leu Gly Leu Leu His Gly Asp Met Asp Gln Ser
405 410 415

Glu Arg Asn Lys Val Ile Ser Asp Phe Lys Lys Lys Asp Ile Pro Val
420 425 430

Leu Val Ala Thr Asp Val Ala Ala Arg Gly Leu Asp Ile Pro Ser Ile
435 440 445

Lys Thr Val Ile Asn Tyr Asp Val Ala Arg Asp Ile Asp Thr His Thr
450 455 460

His Arg Ile Gly Arg Thr Gly Arg Ala Gly Glu Lys Gly Val Ala Tyr
465 470 475 480

Thr Leu Leu Thr Pro Lys Asp Ser Asn Phe Ala Gly Asp Leu Val Arg
485 490 495

Asn Leu Glu Gly Ala Asn Gln His Val Ser Lys Glu Leu Leu Asp Leu
500 505 510

Ala Met Gln Asn Ala Trp Phe Arg Lys Ser Arg Phe Lys Gly Gly Lys
515 520 525

Gly Lys Lys Leu Asn Ile Gly Gly Gly Gly Leu Gly Tyr Arg Glu Arg
530 535 540

Pro Gly Leu Gly Ser Glu Asn Met Asp Arg Gly Asn Asn Asn Val Met
545 550 555 560

Ser Asn Tyr Glu Ala Tyr Lys Pro Ser Thr Gly Ala Met Gly Asp Arg
565 570 575

Leu Thr Ala Met Lys Ala Ala Phe Gln Ser Gln Tyr Lys Ser His Phe
580 585 590

Val Ala Ala Ser Leu Ser Asn Gln Lys Ala Gly Ser Ser Ala Ala Gly
595 600 605

Ala Ser Gly Trp Thr Ser Ala Gly Ser Leu Asn Ser Val Pro Thr Asn
610 615 620

Ser Ala Gln Gln Gly His Asn Ser Pro Asp Ser Pro Val Thr Ser Ala
625 630 635 640

Ala Lys Gly Ile Pro Gly Phe Gly Asn Thr Gly Asn Ile Ser Gly Ala
645 650 655

Pro Val Thr Tyr Pro Ser Ala Gly Ala Gln Gly Val Asn Asn Thr Ala
660 665 670

Ser Gly Asn Asn Ser Arg Glu Gly Thr Gly Gly Ser Asn Gly Lys Arg
675 680 685

Glu Arg Tyr Thr Glu Asn Arg Gly Ser Ser Pro Ser Gln Ser Arg Arg
690 695 700

Asp Trp Gln Ser Ala
705

<210> 336
<211> 480
<212> PRT
<213> Homo sapiens

<400> 336
Met Ile Arg Ala Ala Pro Pro Pro Leu Phe Leu Leu Leu Leu Leu Leu
5 10 15

Leu Leu Leu Val Ser Trp Ala Ser Arg Gly Glu Ala Ala Pro Asp Gln
20 25 30

Asp Glu Ile Gln Arg Leu Pro Gly Leu Ala Lys Gln Pro Ser Phe Arg
35 40 45

Gln Tyr Ser Gly Tyr Leu Lys Ser Ser Gly Ser Lys His Leu His Tyr
50 55 60

Trp Phe Val Glu Ser Gln Lys Asp Pro Glu Asn Ser Pro Val Val Leu
65 70 75 80

Trp Leu Asn Gly Gly Pro Gly Cys Ser Ser Leu Asp Gly Leu Leu Thr
85 90 95

Glu His Gly Pro Phe Leu Val Gln Pro Asp Gly Val Thr Leu Glu Tyr
100 105 110

Asn Pro Tyr Ser Trp Asn Leu Ile Ala Asn Val Leu Tyr Leu Glu Ser
115 120 125

Pro Ala Gly Val Gly Phe Ser Tyr Ser Asp Asp Lys Phe Tyr Ala Thr
130 135 140

Asn Asp Thr Glu Val Ala Gln Ser Asn Phe Glu Ala Leu Gln Asp Phe
145 150 155 160

Phe Arg Leu Phe Pro Glu Tyr Lys Asn Asn Lys Leu Phe Leu Thr Gly
165 170 175

Glu Ser Tyr Ala Gly Ile Tyr Ile Pro Thr Leu Ala Val Leu Val Met
180 185 190

Gln Asp Pro Ser Met Asn Leu Gln Gly Leu Ala Val Gly Asn Gly Leu
195 200 205

Ser Ser Tyr Glu Gln Asn Asp Asn Ser Leu Val Tyr Phe Ala Tyr Tyr
210 215 220

His Gly Leu Leu Gly Asn Arg Leu Trp Ser Ser Leu Gln Thr His Cys
225 230 235 240

Cys Ser Gln Asn Lys Cys Asn Phe Tyr Asp Asn Lys Asp Leu Glu Cys
245 250 255

Val Thr Asn Leu Gln Glu Val Ala Arg Ile Val Gly Asn Ser Gly Leu

260 265 270

Asn Ile Tyr Asn Leu Tyr Ala Pro Cys Ala Gly Gly Val Pro Ser His
275 280 285

Phe Arg Tyr Glu Lys Asp Thr Val Val Val Gln Asp Leu Gly Asn Ile
290 295 300

Phe Thr Arg Leu Pro Leu Lys Arg Met Trp His Gln Ala Leu Leu Arg
305 310 315 320

Ser Gly Asp Lys Val Arg Met Asp Pro Pro Cys Thr Asn Thr Thr Ala
325 330 335

Ala Ser Thr Tyr Leu Asn Asn Pro Tyr Val Arg Lys Ala Leu Asn Ile
340 345 350

Pro Glu Gln Leu Pro Gln Trp Asp Met Cys Asn Phe Leu Val Asn Leu
355 360 365

Gln Tyr Arg Arg Leu Tyr Arg Ser Met Asn Ser Gln Tyr Leu Lys Leu
370 375 380

Leu Ser Ser Gln Lys Tyr Gln Ile Leu Leu Tyr Asn Gly Asp Val Asp
385 390 395 400

Met Ala Cys Asn Phe Met Gly Asp Glu Trp Phe Val Asp Ser Leu Asn
405 410 415

Gln Lys Met Glu Val Gln Arg Arg Pro Trp Leu Val Lys Tyr Gly Asp
420 425 430

Ser Gly Glu Gln Ile Ala Gly Phe Val Lys Glu Phe Ser His Ile Ala
435 440 445

Phe Leu Thr Ile Lys Gly Ala Gly His Met Val Pro Thr Asp Lys Pro
450 455 460

Leu Ala Ala Phe Thr Met Phe Ser Arg Phe Leu Asn Lys Gln Pro Tyr
465 470 475 480

<210> 337
<211> 543
<212> PRT
<213> Homo sapiens

<400> 337
Met Ala Ala Ala Lys Ala Glu Met Gln Leu Met Ser Pro Leu Gln Ile
5 10 15

Ser Asp Pro Phe Gly Ser Phe Pro His Ser Pro Thr Met Asp Asn Tyr
20 25 30

Pro Lys Leu Glu Glu Met Met Leu Leu Ser Asn Gly Ala Pro Gln Phe

```
                35                      40                      45

Leu Gly Ala Ala Gly Ala Pro Glu Gly Ser Gly Ser Asn Ser Ser Ser
        50                  55                  60

Ser Ser Ser Gly Gly Gly Gly Gly Gly Gly Gly Gly Ser Asn Ser Ser
65                  70                  75                  80

Ser Ser Ser Ser Thr Phe Asn Pro Gln Ala Asp Thr Gly Glu Gln Pro
                85                  90                  95

Tyr Glu His Leu Thr Ala Glu Ser Phe Pro Asp Ile Ser Leu Asn Asn
            100                 105                 110

Glu Lys Val Leu Val Glu Thr Ser Tyr Pro Ser Gln Thr Thr Arg Leu
        115                 120                 125

Pro Pro Ile Thr Tyr Thr Gly Arg Phe Ser Leu Glu Pro Ala Pro Asn
    130                 135                 140

Ser Gly Asn Thr Leu Trp Pro Glu Pro Leu Phe Ser Leu Val Ser Gly
145                 150                 155                 160

Leu Val Ser Met Thr Asn Pro Pro Ala Ser Ser Ser Ser Ala Pro Ser
                165                 170                 175

Pro Ala Ala Ser Ser Ala Ser Ala Ser Gln Ser Pro Pro Leu Ser Cys
            180                 185                 190

Ala Val Pro Ser Asn Asp Ser Ser Pro Ile Tyr Ser Ala Ala Pro Thr
        195                 200                 205

Phe Pro Thr Pro Asn Thr Asp Ile Phe Pro Glu Pro Gln Ser Gln Ala
    210                 215                 220

Phe Pro Gly Ser Ala Gly Thr Ala Leu Gln Tyr Pro Pro Pro Ala Tyr
225                 230                 235                 240

Pro Ala Ala Lys Gly Gly Phe Gln Val Pro Met Ile Pro Asp Tyr Leu
                245                 250                 255

Phe Pro Gln Gln Gln Gly Asp Leu Gly Leu Gly Thr Pro Asp Gln Lys
            260                 265                 270

Pro Phe Gln Gly Leu Glu Ser Arg Thr Gln Gln Pro Ser Leu Thr Pro
        275                 280                 285

Leu Ser Thr Ile Lys Ala Phe Ala Thr Gln Ser Gly Ser Gln Asp Leu
    290                 295                 300

Lys Ala Leu Asn Thr Ser Tyr Gln Ser Gln Leu Ile Lys Pro Ser Arg
305                 310                 315                 320

Met Arg Lys Tyr Pro Asn Arg Pro Ser Lys Thr Pro Pro His Glu Arg
                325                 330                 335
```

Pro Tyr Ala Cys Pro Val Glu Ser Cys Asp Arg Arg Phe Ser Arg Ser
340 345 350

Asp Glu Leu Thr Arg His Ile Arg Ile His Thr Gly Gln Lys Pro Phe
355 360 365

Gln Cys Arg Ile Cys Met Arg Asn Phe Ser Arg Ser Asp His Leu Thr
370 375 380

Thr His Ile Arg Thr His Thr Gly Glu Lys Pro Phe Ala Cys Asp Ile
385 390 395 400

Cys Gly Arg Lys Phe Ala Arg Ser Asp Glu Arg Lys Arg His Thr Lys
405 410 415

Ile His Leu Arg Gln Lys Asp Lys Lys Ala Asp Lys Ser Val Val Ala
420 425 430

Ser Ser Ala Thr Ser Ser Leu Ser Ser Tyr Pro Ser Pro Val Ala Thr
435 440 445

Ser Tyr Pro Ser Pro Val Thr Thr Ser Tyr Pro Ser Pro Ala Thr Thr
450 455 460

Ser Tyr Pro Ser Pro Val Pro Thr Ser Phe Ser Ser Pro Gly Ser Ser
465 470 475 480

Thr Tyr Pro Ser Pro Val His Ser Gly Phe Pro Ser Pro Ser Val Ala
485 490 495

Thr Thr Tyr Ser Ser Val Pro Pro Ala Phe Pro Ala Gln Val Ser Ser
500 505 510

Phe Pro Ser Ser Ala Val Thr Asn Ser Phe Ser Ala Ser Thr Gly Leu
515 520 525

Ser Asp Met Thr Ala Thr Phe Ser Pro Arg Thr Ile Glu Ile Cys
530 535 540

<210> 338
<211> 148
<212> PRT
<213> Homo sapiens

<400> 338
Pro Pro Ala Thr Ser Tyr Ala Pro Ser Asp Val Pro Ser Gly Val Ala
5 10 15

Leu Phe Leu Thr Ile Pro Phe Ala Phe Phe Leu Pro Glu Leu Ile Phe
20 25 30

Gly Phe Leu Val Trp Thr Met Val Ala Ala Thr His Ile Val Tyr Pro
35 40 45

Leu Leu Gln Gly Trp Val Met Tyr Val Ser Leu Thr Ser Phe Leu Ile
50 55 60

Ser Leu Met Phe Leu Leu Ser Tyr Leu Phe Gly Phe Tyr Lys Arg Phe
65 70 75 80

Glu Ser Trp Arg Val Leu Asp Ser Leu Tyr His Gly Thr Thr Gly Ile
85 90 95

Leu Tyr Met Ser Ala Ala Val Leu Gln Val His Ala Thr Ile Val Ser
100 105 110

Glu Lys Leu Leu Asp Pro Arg Ile Tyr Tyr Ile Asn Ser Ala Ala Ser
115 120 125

Phe Phe Ala Phe Ile Ala Thr Leu Leu Tyr Ile Leu His Ala Phe Ser
130 135 140

Ile Tyr Tyr His
145

<210> 339
<211> 196
<212> PRT
<213> Homo sapiens

<400> 339
Met Pro Gly Met Phe Phe Ser Ala Asn Pro Lys Glu Leu Lys Gly Thr
5 10 15

Thr His Ser Leu Leu Asp Asp Lys Met Gln Lys Arg Arg Pro Lys Thr
20 25 30

Phe Gly Met Asp Met Lys Ala Tyr Leu Arg Ser Met Ile Pro His Leu
35 40 45

Glu Ser Gly Met Lys Ser Ser Lys Ser Lys Asp Val Leu Ser Ala Ala
50 55 60

Glu Val Met Gln Trp Ser Gln Ser Leu Glu Lys Leu Leu Ala Asn Gln
65 70 75 80

Thr Gly Gln Asn Val Phe Gly Ser Phe Leu Lys Ser Glu Phe Ser Glu
85 90 95

Glu Asn Ile Glu Phe Trp Leu Ala Cys Glu Asp Tyr Lys Lys Thr Glu
100 105 110

Ser Asp Leu Leu Pro Cys Lys Ala Glu Glu Ile Tyr Lys Ala Phe Val
115 120 125

His Ser Asp Ala Ala Lys Gln Ile Asn Ile Asp Phe Arg Thr Arg Glu
130 135 140

Ser Thr Ala Lys Lys Ile Lys Ala Pro Thr Pro Thr Cys Phe Asp Glu
145 150 155 160

Ala Gln Lys Val Ile Tyr Thr Leu Met Glu Lys Asp Ser Tyr Pro Arg
165 170 175

Phe Leu Lys Ser Asp Ile Tyr Leu Asn Leu Leu Asn Asp Leu Gln Ala
180 185 190

Asn Ser Leu Lys
195

<210> 340
<211> 316
<212> PRT
<213> Homo sapiens

<400> 340
Met Ala Thr Phe Val Glu Leu Ser Thr Lys Ala Lys Met Pro Ile Val
5 10 15

Gly Leu Gly Thr Trp Lys Ser Pro Leu Gly Lys Val Lys Glu Ala Val
20 25 30

Lys Val Ala Ile Asp Ala Gly Tyr Arg His Ile Asp Cys Ala Tyr Val
35 40 45

Tyr Gln Asn Glu His Glu Val Gly Glu Ala Ile Gln Glu Lys Ile Gln
50 55 60

Glu Lys Ala Val Lys Arg Glu Asp Leu Phe Ile Val Ser Lys Leu Trp
65 70 75 80

Pro Thr Phe Phe Glu Arg Pro Leu Val Arg Lys Ala Phe Glu Lys Thr
85 90 95

Leu Lys Asp Leu Lys Leu Ser Tyr Leu Asp Val Tyr Leu Ile His Trp
100 105 110

Pro Gln Gly Phe Lys Ser Gly Asp Asp Leu Phe Pro Lys Asp Asp Lys
115 120 125

Gly Asn Ala Ile Gly Gly Lys Ala Thr Phe Leu Asp Ala Trp Glu Ala
130 135 140

Met Glu Glu Leu Val Asp Glu Gly Leu Val Lys Ala Leu Gly Val Ser
145 150 155 160

Asn Phe Ser His Phe Gln Ile Glu Lys Leu Leu Asn Lys Pro Gly Leu
165 170 175

Lys Tyr Lys Pro Val Thr Asn Gln Val Glu Cys His Pro Tyr Leu Thr
180 185 190

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Gln Glu Lys Leu Ile Gln Tyr Cys His Ser Lys Gly Ile Thr Val Thr
        195                 200                 205

Ala Tyr Ser Pro Leu Gly Ser Pro Asp Arg Pro Trp Ala Lys Pro Glu
    210                 215                 220

Asp Pro Ser Leu Leu Glu Asp Pro Lys Ile Lys Glu Ile Ala Ala Lys
225                 230                 235                 240

His Lys Lys Thr Ala Ala Gln Val Leu Ile Arg Phe His Ile Gln Arg
                245                 250                 255

Asn Val Ile Val Ile Pro Lys Ser Val Thr Pro Ala Arg Ile Val Glu
            260                 265                 270

Asn Ile Gln Val Phe Asp Phe Lys Leu Ser Asp Glu Glu Met Ala Thr
        275                 280                 285

Ile Leu Ser Phe Asn Arg Asn Trp Arg Ala Cys Asn Val Leu Gln Ser
    290                 295                 300

Ser His Leu Glu Asp Tyr Pro Phe Asn Ala Glu Tyr
305                 310                 315

<210> 341
      <211> 422
      <212> DNA
      <213> Homo sapien

      <220>
      <221> misc_feature
      <222> (1)...(422)
      <223> n = A,T,C or G

      <400> 341
gatganattn ttncnagaga gaggaagang ctattcagtt ggatgggatt aaatgcatca    60
caaataagag aacttagaga gaagtcggaa aagtttgcct tccaagcccg aagttaacag   120
aatgatgaaa cttatcatca attcattgta taaaaataaa gagattttcc tgagagaact   180
gatttcaaat gcttctgatg ctttagataa gataaggcta atatcactga ctgatgaaaa   240
tgctctttct ggaaatgagg aactaacagt caaaattaag tgtgataagg agaagacctg   300
ctgcatgtca cagacaccgg tgtaggaatg accagagaag agttggttaa aaaccttggt   360
accatagcca aatctgggac aagcgagttt ttaaacaaaa tgactgaagc acaggaagat   420
gg                                                                  422

      <210> 342
      <211> 472
      <212> DNA
      <213> Homo sapien

      <220>
      <221> misc_feature
      <222> (1)...(472)
      <223> n = A,T,C or G
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<400> 342
ctggagaagg tgtgcagggg aaaccctgct gatgtcaccg aggccaggtt gtctttctac 60
tcgggacact cttcctttgg gatgtactgc atggtgttct tggcgctgna tgtgcaggca 120
cgactctgtt ggaagtgggc acggctgctg cgacccacag tccagttctt cctggtggcc 180
tttgccctct acgtgggcta cacccgcgtg tctgattaca aacaccactg gagcgatgtc 240
cttgttggcc tcctgcaggg ggcactggtg [illegible] [illegible] [illegible] 300
ttcctcaaag cccgaccccc acagcactgt ctgaaggagg aggagctgga acggaagccc 360
agcctgtcac tgacgttgac cctgggcgag gctgaccaca accactatgg atacccgcac 420
tcctcctcct gaggccggac cccgcccagg cagggagcta ctgtgagtcc ag 472

<210> 343
<211> 139
<212> DNA
<213> Homo sapien

<400> 343
gtcctgggcc ttccccttcc ctcaagccag ggctcctcct cctgtcgtgg gctcattgtg 60
accactggcc tctctacagc acggcctgtg gcctgttcaa ggcagaacca cgacccttga 120
ctcccgggtg gggaggtgg 139

<210> 344
<211> 235
<212> DNA
<213> Homo sapien

<400> 344
ctgcgggctc agcacagtag acatgactgg gatccccacc ttggacaacc tccagaaggg 60
agtccaattt gctctcaagt accagtcgct gggccagtgt gtttacgtgc attgtaaggc 120
tgggcgctcc aggagtgcca ctatggtggc agcatacctg attcaggtgc acaaatggag 180
tccagaggag gctgtaagag ccatcgccaa gatccggtca tacatccaca tcagg 235

<210> 345
<211> 458
<212> DNA
<213> Homo sapien

<400> 345
ctgtaaggtg ctattcagtc ctgtgaccct tattttggaa tgctcttcat tactgttgct 60
ctgttttgtg acttcctggg aaaccgccta ctttggtgtg gtgtcacctt gagctgtgca 120
cataggacac cagttttgac ttaacctaac aggcagtttt tatctctagc tttttcaagc 180
caggtattga gcagtttctt ggccaatggc ctgagaaacc acctgtccct gtcaaggggt 240
gattttattg gttttaagtg gggaagtaat cccatgtact tatttcttaa atacctagga 300
agttcttctt ggtggctcct cttggccctc ccctctttct cccccaaccc accatcctgc 360
aaggcaagga atggcctctc cctccacaga ggcaacggct gcagagggag cactgtggct 420
gccatcccag ttcctcttca aagccaaaca gacacgcg 458

<210> 346
<211> 525
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(525)
<223> n = A,T,C or G

<400> 346
ccagagcaca acgcctcacc atggactgga cctggaggat nntcttnnng gtggcagcag 60
ccacaggtgt ccactcccaa gcccaacttg tgcagtctgg ggctgaggag aagaagcctg 120
gggcctcagt gactatttct tgtaaggctt ctggatatat ncttactaaa tatactttac 180
attgggtgcg ccaggccccc cccggacaaa gacctgaatg ggtgggatgg atcaacactg 240
gcattgatac cgttaaatat tcacagaagt ttcaggacag agtctccatt acctgggact 300
catccgcgac cacagnctac ctgnanntga gtagcctgga atccgaagac acggctgtgt 360
attactgtgc gagacttang gcccgttcgc tgtggtggga cttaatgacg cttttgacat 420
ctggggccaa gggacagtgg tcaccgtctc ttcanggagt gcattcgccc caaccctttt 480
ccccctctct cctgtgaaga attccccgnc ggatacgagc agcgt 525

<210> 347
<211> 423
<212> DNA
<213> Homo sapien

<400> 347
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cagtcttgct cttcacctct aagccaatgt tgaccccttc atctataaag tccacaactc 120
tccggaagtc atcctcacgg aactgtcgag aagttaaggc tggggcccca agccgcaggc 180
cgcccggtgt gatggcactt cggtctccag gacaggtgtt cttgttggca gtgatggata 240
caagctctag cacccgctca gcccgagctc catccaggcc cttgggccgc aggtccacca 300
gcaccaggtg gttgtcagta ccacctgata ccagtgagta gcctcgctct agcagggcat 360
ctgccatggc ccgagcattc ttcagaacct gcagggagta ctcccggaac atgggggtgc 420
agg 423

<210> 348
<211> 513
<212> DNA
<213> Homo sapien

<400> 348
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cagacaatga aaccctccta accctcttcc ccactaccca caactcccta cactgccaat 120
ctaaataaaa agaggacaat gcatgagtgt gagatacaca tacacacaca cacatacaca 180
cacacacacg cacagcttcc tttcagccaa agaactgcaa aatccttccc cggaaggagg 240
acaactggca acaccaatca aggcttggtg gtctaaggtg atggctggaa tcatgtgaga 300
ctggtaaaaa tccagggaga aaatgtttca ccttcagctc attcccaagt ctctatgaag 360
cccgccccac ttccacatag gggaactgtg gctctggggg cagcctctgc agctactcag 420
aataggtggg aggaggggct ggctttgagg ctgccttagc catgaggctc tttgcctagg 480
aatagctgga gatgggagct gcagggggct cag 513

<210> 349
<211> 231
<212> DNA
<213> Homo sapien

<400> 349
ccttatttct cttgtccttt cgtacaggga ggaatttgaa gtagatagaa accgacctgg 60
attactccgg tctgaactca gatcacgtag gactttaatc gttgaacaaa cgaaccttta 120
atagcggctg caccatcggg atgtcctgat ccaacatcga ggtcgtaaac cctattgttg 180
atatggactc tagagtagga ttgcgctgtt atccctaggg taacttgttc c 231

<210> 350

<211> 341
<212> DNA
<213> Homo sapien

<400> 350
ctgcccaagg gcgttcgtaa cgggaatgcc gaagcgtggg [illegible] [illegible] 60
agacggggat gagctcagga cagagccaga ggccaagaag agtaagacgg ccgcaaagaa 120
aaatgacaaa gaggcagcag gagagggccc agccctgtat gaggaccccc cagatcagaa 180
aacctcaccc agtggcaaac ctgccacacc caagatctgc tcttggaatg tggatgggct 240
tcgagcctgg attaagaaga aaggattaga ttgggtaaag gaagaagccc cagatatact 300
gtgccttcaa gagaccaaat gttcagagaa caaactacca g 341

<210> 351
<211> 256
<212> DNA
<213> Homo sapien

<400> 351
ggcgttgggg acggttgtag gacgtggctc tttattcgtg agttttccat ttacctccgc 60
tgaacctaga gcttcagacg ccctatggcg tccgcctcga cccaaccggc ggccttgagc 120
gctgagcaag caaaggtggt cctcgcggag gtgatccagg cgttctccgc cccggagaat 180
gcagtgcgca tggacgaggc tcgggataac gcctgcaacg acatgggtaa gatgctgcaa 240
ttcgtgctgc ccgtgg 256

<210> 352
<211> 368
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(368)
<223> n = A,T,C or G

<400> 352
cctttcttgt aagtgaagaa naaggaatgc agcaaagaag agttcgacat tggagtcctt 60
agttccatca ggatcccatt cgcagccttt agcatcatgt agaagcaaac tgcacctatg 120
gctgagatag gtgcaatgac ctacaagatt ttgtgttttc tagctgtcca ggaaaagcca 180
tcttcagtct tgctgacagt caaagagcaa gtgaaaccat ttccagccta aactacataa 240
aagcagccga accaatgatt aaagacctct aaggctccat aatcatcatt aaatatgccc 300
aaactcattg tgacttttta ttttatatac aggattaaaa tcaacattaa atcatcttat 360
ttacatgg 368

<210> 353
<211> 368
<212> DNA
<213> Homo sapien

<400> 353
ctgaggggtg gcagtaagca atgaggatgg gctataaagc tgttaactgg ctaagggcca 60
tccttgggca ggcatttcag acacatctgt agagagggca gtagcatctc cgataggcca 120
gctctgaagg aagcttaatg cttaatacag tcacactgca taaattagct tagaatgctc 180
tcttgggtaa aaaatattaa tagtgtatat gcacttgaag agcaaaattc ctcaagaaaa 240
aaagtttaat agcaaggagt ttccatcagt cccggtcttt gtgaggatta ccacaacaaa 300
cacttaaaag gatacaacag gtacttatta aatgctgcct tgccttttac ctcttccttt 360

tttttttt 368

<210> 354
<211> 380
<212> DNA
<213> Homo sapien

<400> 354
ccatggcttc tcacccagac agtctttctg ggcaacttgg ggaagcccct gttctgctca 60
agtctcaccc catggaagag gtgggggaag ggggccttgg tttttcagga agacaggttg 120
gagagcacga gtcactacaa agcagtaaaa gtgaatggtg tctccagggg ctgggtccag 180
aacaccacgg agagccccag ccataaaggt gtgttccgcc tctggcctgc aggaatctct 240
ttgaatctct ttgattggtg gctccaagag caatgggaag tcaacagcca ggaggctgga 300
ctgggttccc tgggaccccg aggtcccaga gctgctgggc agtggttgtc ggcaaagaag 360
aaaggtccaa gagggtcagg 380

<210> 355
<211> 347
<212> DNA
<213> Homo sapien

<400> 355
ccagtggagg ggtgggggta tcgatcccgc cgggggctgg cttggttgct ggtgccctga 60
gcccttctct gcccgcctgg gtgttgcctt cactgatgga ggtaggcgtc cagccagatg 120
tcaccagact tcttcgggga cctgacgatg tccaccagcg cggtgaggaa gggcttcact 180
tcgtagctga ggccgtgctt ggcacacagc gacttgacca gcggggccac ccggctgtag 240
ttgtgtctcg gcatcctggg gaagaggtgg tgctcgatct ggaagttgag gtgcccgctg 300
aaccagttgg tgaaaagtga gggctccacg ttgcaggtgg ctgccag 347

<210> 356
<211> 157
<212> DNA
<213> Homo sapien

<400> 356
cctggagctg ctgaagactg ctattgggaa agctggctac actgataagg tggtcatcgg 60
catggacgta gcggcctccg agttcttcag gtctgggaag tatgacctgg acttcaagtc 120
tcccgatgac cccagcaggt acatctcgcc tgaccag 157

<210> 357
<211> 323
<212> DNA
<213> Homo sapien

<400> 357
ccatacaggg ctgttgccca ggccctagag gtcactcctc gtaccctgat ccagaactgt 60
ggggccagca ccatccgtct acttacctcc cttcgggcca agcacaccca ggagaactgt 120
gagacctggg gtgtaaatgg tgagacgggt actttggtgg acatgaagga actgggcata 180
tgggagccat tggctgtgaa gctgcagact tataagacag cagtggagac ggcagttctg 240
ctactgcgaa ttgatgacat cgtttcaggc cacaaaaaga aaggcgatga ccagagccgg 300
caaggcgggg ctcctgatgc tgg 323

<210> 358
<211> 555
<212> DNA

<213> Homo sapien

<400> 358
aaaaggtttc taaaacatga cggaggttga gatgaagctt cttcatggag taaaaaatgt 60
atttaaaaga aaattgagag aaaggactac agagccccga gttaatacca atagaagggc 120
aatgctttta gattaaaatg aaggtgactt aaacagctta [illegible] [illegible] 180
aggtgattaa aataatttga aggcgatctt ttaaaaagag attaaaccga aggtgattaa 240
aagaccttga aatccatgac gcagggagaa ttgcgtcatt taaagcctag ttaacgcatt 300
tactaaacgc agacgaaaat ggaaagatta attgggagtg gtaggatgaa acaatttgga 360
gaagatagaa gtttgaagtg gaaaactgga agacagaagt acgggaaggc gaagaaaaga 420
atagagaaga tagggaaatt agaagataaa aacatacttt tagaagaaaa aagataaatt 480
taaacctgaa aagtaggaag cagaagaaaa aagacaagct aggaaacaaa aagctaaggg 540
caaaatgtac accac 555

<210> 359
<211> 549
<212> DNA
<213> Homo sapien

<400> 359
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tcaaccacag tctgacacca gagcccactt ccatcctctc tggtgtgagg cacagcgagg 180
gcagcatctg gaggagctct gcagcctcca cacctaccac gacctcccag ggctgggctc 240
aggaaaaacc agccactgct ttacaggaca gggggttgaa gctgagcccc gcctcacacc 300
cacccccatg cactcaaaga ttggatttta cagctacttg caattcaaaa ttcagaagaa 360
taaaaaatgg gaacatacag aactctaaaa gatagacatc agaaattgtt aagttaagct 420
ttttcaaaaa atcagcaatt ccccagcgta gtcaagggtg gacactgcac gctctggcat 480
gatgggatgg cgaccgggca agctttcttc ctcgagatgc tcttgctgct tgagagctat 540
tgctttggt 549

<210> 360
<211> 289
<212> DNA
<213> Homo sapien

<400> 360
tttaaatttt actagtgtta cttaatgtat attctaaaaa gagaatgcag taactaatgc 60
cctaaatgtt tgatctctgt ttgtcattac tttttcaaaa ttattttttt ctgtaaagta 120
taatatataa aacttcttgc ttaaattgaa tttctatatt agtggttaat tgcagtttat 180
taaagggatc attatcagta atttcatagc aactgttcta gtgttttgtg tttttaaaac 240
agaattagga atttgagata tctgattata tttttcatat gaatcacag 289

<210> 361
<211> 311
<212> DNA
<213> Homo sapien

<400> 361
ctgttcagta tggcaaaggg cagacttact ccttcatcca ctctgctgcc ttgatgaggt 60
gaacacactg gaataagatg gagggcagga tacctgccaa agcctgagga atgagatgat 120
ctgaaacaat tgggcaaagg ctggacattt caaaaagctg acttccaact gcagtttatg 180
ggtatagaat ttgatgcttc cctcaagtcc tgactgctct ttctgaggca gccaggctag 240
gccaagaaat gagctgctcc agcttctcca gagcacagca gcctcccagg gcctgtcagc 300
atctgcagca g 311

<210> 362
<211> 496
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(496)
<223> n = A,T,C or G

<400> 362
ccagtttcta aaanaatgca catttaaaga gaagcatcta ccacggcttt aaaacaaaac 60
aactctgaga tgaacaatat gtgttatact cagagattaa caatctcaat catacatact 120
gattctttca gacatttaat aaccactaga tttttttgca ttaatgaagt ttgactatat 180
gtgtaaaggg actaaatatt tttgcaacag cctgttcttt gttcattctt ttctggatag 240
cgtgtcctct gtattgcggt agatttatac attctgttgc ctaaatatgt gtgtaaaatg 300
agctgataaa ctggagtact acttaaaaaa aagtctgtga tttataagat gcatatgctt 360
tctatgtgaa tataagcttg tgcacaatgt ttaaaagaaa aacaatgaat tagaagagat 420
cccccgtccc ccagtctgac atatttcata cagaatgttt aaaagaaaaa ctctgctagt 480
cttggcaaac atttgg 496

<210> 363
<211> 673
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(673)
<223> n = A,T,C or G

<400> 363
ccaagaggga gataanacaa acttctcaaa caaaaagaaa agaaaaacga atgattcatc 60
tgctttaatc agtgtgatta atgcagcacc cattgccccg ggaaccgttt ctgctgtact 120
atctggatac taaaatgtta cggaagtagc tctttgttct ccctcactct gcccttagtt 180
aatagaaatt cagactcgcc aagtaaggct ttgtgcatag tgtcttcatg tcgcgtatag 240
ttgagcgcgt tcttagcagt tggcttcatg gacagctcat tagtgttttg acttttctta 300
cccagcgtta attgaattct tgcttttaga caacttcctt tttgtagtgg tgaaccttgc 360
cctttagtac agttcaagtg aatctggata attgttcatc tttgctttag cttagatacc 420
atgtagtggt ctgtggctac aggaagctgg ttctgtctgc ttccacagtc tgcttaaaaa 480
actgtctgac ttcgtgaata tagagaccaa gtttaccact tctgatgaag agaccaatta 540
agattcattc ctcattctgt ttctttccag tgggagaaga gtccccatga aataagatga 600
aactgattcc atgcactagt acatgtaggc ttctcccttg cgcaaagctt aacaatttgt 660
aggaaacttt ggg 673

<210> 364
<211> 495
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(495)
<223> n = A,T,C or G

<400> 364
ccaaatgttt gcncaagact agcagagttt ttcttttaaa cattctgtat gaaatatgtc 60
agactggggg acgggggatc tcttctaatt cattgttttt cttttaaaca ttgtgcacaa 120
gcttatattc acatagaaag catatacatc ttataaatca cagacttttt tttaagtagt 180
actccagttt atcagctcat tttacacaca tatttaggca [illegible] [illegible] 240
gcaatacaga ggacacacta tccagaaaag aatgaacaaa gaacaggctg ttgcaaaaat 300
atttagtccc tttacacata tagtcaaact tcattaatgc aaaaaatgta gtggttatta 360
aatgtctgaa agaatcagta tgtatgattg agattgttaa tctctgagta taacacatat 420
tgttcatctc agagttgttt tgttttaaag ccgtggtaga tgcttctctt taaatgtgca 480
tttttagaa actgg 495

<210> 365
<211> 291
<212> DNA
<213> Homo sapien

<400> 365
aactgacaag cccttgcgcc tgcctctcca ggatgtctac aaaattggtg gtattggtac 60
tgttcctgtt ggcccgagtg gagactggtg ttctcaaacc cggtatggtg gtcacctttg 120
ctccagtcaa cgttacaacg gaagtaaaat ctgtcgaaat gcaccatgaa gctttgagtg 180
aagctcttcc tggggacaat gtgggcttca atgtcaagaa tgtgtctgtc aaggatgttc 240
gtcgtggcaa cgttgctggt gacagcaaaa atgacccacc aatggaagca g 291

<210> 366
<211> 277
<212> DNA
<213> Homo sapien

<400> 366
ctggatggtg cctcagaagg tgcattctgc ttctgcaggg gcttgaaaca ccaaggcact 60
ccagggatcc tggagtcaaa gcagcagccc cggttgttgc actccttggg ggtgacatgg 120
gggtagcccg cagtccaccc tgtccttggc tggcacggca cactggtttg cagacaggcc 180
cacgtactcc tcagcagagc tggaggacaa gcaaggccag gaccagcccc agcatgcaga 240
gcgctctggc agccatgacc accgtgggct ccgggac 277

<210> 367
<211> 311
<212> DNA
<213> Homo sapien

<400> 367
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tcaggatcat ctcgaagatc atgatcacag cgaccacgat ggcagcaatg ccgatgaggt 120
acagcttccc ggagaagagg tcatcgatct tctggtggca gtcctccttg aagaggttgc 180
tgatgatgtt gctgcccgag ggacacaaat tgttcttgag cactgaggtg gtcaaagcag 240
tcagtgtgct ggagccacag cagtcaagcg tctcgtggaa ggtcttcacc acagccttgg 300
cgttgttggc g 311

<210> 368
<211> 384
<212> DNA
<213> Homo sapien

<400> 368

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ccaaaggggt ctctagctgc tgctctgctg ctcctgctca tggatgagtt tggcgatggg    60
gccggtgatg ccgcctatca aggtccagta ctcatcgaag ctgatgcgcc catcaggatt   120
ggcatccagg ttctggatga gcttatccgc agccttccgg ttccctgtgt ccgacagcat   180
gtggttcagc tctttctgga gcatctcgcg gaagctgctc ttgctgatct tgttcttgac   240
caggctgtac ctagacacat atttgtagaa gttttccacc aggacaatga ctgccttctc   300
cagctccgtg tagcaagtct gacatctccc tgcttcgcct gctggcgggg cctaaggcgg   360
gggccaagcc cagttacagc ccag                                          384
```

<210> 369
<211> 216
<212> DNA
<213> Homo sapien

<400> 369

```
ccaagtgcca ggtggctttc agcagcttcc tacgatcagc cgaagaaagc agaagctctg    60
gaggctgcca tcgagaacct caatgaagcc aagaactatt ttgcaaaggt tgactgcaaa   120
gagcgcatca gggacgtcgt ttacttccag gccagactct accataccct ggggaagacc   180
caggagagga accggtgtgc gatgctcttc cggcag                             216
```

<210> 370
<211> 561
<212> DNA
<213> Homo sapien

<400> 370

```
ctggctcctt cttttgtggt cgtttggggg atgggctggt ttggggttta ggtgcagaga    60
atggtttggg gccactgcgt actggaccac tctgagcctt cagggcaggg ttcttgtgag   120
tcttcatgtc atcagataca tgtttcaggg catgtgtaat gctctccccc tgattaatct   180
gcgcgaacag tgctgagcgg gaagcagact catctgagcc tgaactggta gagactgggg   240
gaggaggggg gcctggtgga gggggaggag gacctgatcc ggcagagggt ccagatggca   300
gtccgctcag ttcttttgcc acaggccccg ttttgctcca ggccagtccg gtggtatgga   360
actccttaat gtaagcctgc agctctgtcc atatacttaa ataagctttg acccagtcta   420
catgcttctt atccacatct ttgtactctt tgaggactcg gtttgtataa aacatggcgg   480
catcattcat ttctttcgca taagggccag gcttgggagc catagccacc cagcccaggg   540
cctggatact ttcgctgaca g                                             561
```

<210> 371
<211> 518
<212> DNA
<213> Homo sapien

<400> 371

```
cccacttcca tcgctctctg gtgtgaggca cagcgagggc agcatctgga ggagctctgc    60
agcctccaca cctaccacga cctcccaggg ctgggctcag gaaaaaccag ccactgcttt   120
acaggacagg gggttgaagc tgagccccgc ctcacaccca cccccatgca ctcaaagatt   180
ggattttaca gctacttgca attcaaaatt cagaagaata aaaaatggga acatacagaa   240
ctctaaaaga tagacatcag aaattgttaa gttaagcttt ttcaaaaaat cagcaattcc   300
ccagcgtagt caagggtgga cactgcacgc tctggcatga tgggatggcg accgggcaag   360
ctttcttcct cgagatgctc tgctgcttga gagctattgc tttgttaaga tataaaaagg   420
ggtttctttt tgtctttctg taaggtggac ttccagcttt tgattgaaag tcctagggtg   480
attctatttc tgctgtgatt tatctgctga aagctcag                           518
```

<210> 372
<211> 335
<212> DNA

<213> Homo sapien

<400> 372
ctggaggctg ggtgcaccct gcccagatcc acacctgtac cccggcggaa aggctcatgg 60
gcattgaaga cggtggtgaa aaagccaaag ggaaaagcac caacaccaaa tgagaagtgg 120
aagcccccgg tatcaccaaa tggctggaat ccccctctgc [illegible] [illegible] 180
ccctgggggc ggggtggagt ttttaatctg ggatcctggg gcttctggct ccctcgccca 240
taaagcggga caaccttctc tctgctgatc ccagctttac atactggaca ctcttgccgt 300
tctggccgtg tctccagcca ctgatgaaga catgg 335

<210> 373
<211> 467
<212> DNA
<213> Homo sapien

<400> 373
ccactagctg aatcttgaca tggaaggttt tagctaatgc caagtggaga tgcagaaaat 60
gctaagttga cttaggggct gtgcacagga actaaaaggc aggaaagtac taaatattgc 120
tgagagcatc caccccagga aggactttac cttccaggag ctccaaactg gcaccacccc 180
cagtgctcac atggctgact ttatcctccg tgttccattt ggcacagcaa gtggcagtgt 240
ctccaccacc tatgatggtg atgcagcccc tagaagtggc tttcaccacc tcatccatga 300
gagctttggt tccccgggca aaagcttccc attcaaatac ccccacagga ccattccaca 360
caatctgctt agcccgagtg acagcctcag catacttctt gctgctttca ggaccacagt 420
ccaagcccat ccagccagca ggtacgccag aagccacagt ggcttgg 467

<210> 374
<211> 284
<212> DNA
<213> Homo sapien

<400> 374
tttccgtaaa agcgtgtaac aagggtgtaa atatttataa tttttttatac ctgttgtgag 60
acccgagggg cggcggcgcg gttttttatg gtgacacaaa tgtatatttt gctaacagca 120
attccaggct cagtattgtg accgcggagc cacaggggac cccacgcaca ttccgttgcc 180
ttacccgatg gcttgtgacg cggagagaac cgattaaaac cgtttgagaa actcctccct 240
tgtctagccc tgtgttcgct gtggacgctg tagaggcagg ttgg 284

<210> 375
<211> 307
<212> DNA
<213> Homo sapien

<400> 375
cctactcttc tccgtccatt gtactatctg cccgtggtgg ggatggcagt aggatcatat 60
ttgatgactt ccgagaagca tattattggc tccgtcataa tactccagag gatgcgaagg 120
tcatgtcctg gtgggattat ggctatcaga ttacagctat ggcaaaccga acaattttag 180
tggacaataa cacatggaat aatacccata tttctcgagt agggcaggca atggcgtcca 240
cagaggaaaa agcctatgag atcatgaggg agctcgatgt cagctatgtg ctggtcattt 300
ttggagg 307

<210> 376
<211> 650
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(650)
<223> n = A,T,C or G

<400> 376
ccattgnctn ctnacgtgat gtcatcatct gccaggtcat cttggcaaaa gtcggagcat 60
ttctcagtca ctgcaaagta gcccttctcg ttggagcacc ggaagagacg tgtgtgtttc 120
atgtactcgg catcgtcatc atagggcttc tgtgccccaa tgcccaccca gaagaagttc 180
tcaggctcct caccttcgtt gataacctgc ttgctgtagg aggtgtcaaa catggtgttc 240
aggatgtctt ctgccaactt ggcttcgtca gggtctgatg cccggcccac ccaggcatac 300
acgatgccct ggttgtcctc actctcaaag ggaaccttga ggatgaagca gaactcggag 360
ttgaggaggc tggagtcggt gttgatctgg atgcaccggg tgcagagggc gctgccgttg 420
gtgcggatct ggtagaggct gggctgttgg gcgccctgga ccgccttcct cttgccccgg 480
tggatgatga acttcctctt gaaatgggac aggaacttgg ggttctcctg ctgctgcgtc 540
atgcgtacca cctccagctt cccagggaag aggctctcga acttcttttg caggctgaag 600
gtgaaggtga cccacccata ttgggaggct ttcacggccc tgccagaagt 650

<210> 377
<211> 306
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(306)
<223> n = A,T,C or G

<400> 377
tctagatgca tgctcgagcg gccgccagtg tgatgganat ctgcagaatt cgcccttcga 60
gcggccgccc gggcaggttc gggtgctgcc ttcacctgcc aggcccttcc ccgctagctt 120
ggggcgagca gagctgcgtc cagtggaact aaagccgttc caggattatc aaaaactgag 180
cagcaacctt gggggacctg gatcatcacg gactccccca actggaaggt ccttctctgg 240
cctcaattcc cgtctcaagg ccacgccttc cacctacagt ggagtcttcc gcacccagcg 300
cgtcga 306

<210> 378
<211> 199
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(199)
<223> n = A,T,C or G

<400> 378
ccacangtgg cacttgggtg tggctcctct gttatttgtc ctcatgtgag aaagcagatc 60
atctccaaat cttgccattt gtatactttt ggtggagact tggatgtcat atcttctttg 120
ttttgggttt tcttccctag cttatttgt ggcttttaaa gaagtggatt gtattgtgag 180
atcctgtgat tcctggtgg 199

<210> 379
<211> 216
<212> DNA

<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(216)
<223> n = A,T,C or G

<400> 379
ccagggcang tcatcaagag gggcattgtc ttgcatgcgg cctgccgtgt ccaccagcac 60
cacgtcaaag ccttggttac gtgcaaaagc aatggcttcc atggcaatgc cagcagcatc 120
cttgccatag ccctttttcaa acaactgcac catggtgcgg ccaccatgct tctctggagg 180
gtgtagggca ctcaaacgcc gggtgtgtgt acgcag 216

<210> 380
<211> 555
<212> DNA
<213> Homo sapien

<400> 380
ccatgggcct tcctttccac taaaaggaat tccgaacagc aaaaagaagg tcttgagata 60
gtgaaaatgg tgatgatatc tttagaaggt gaagatgggt tggatgaaat ttattcattc 120
agtgagagtc tgagaaaact gtgcgtcttc aagaaaattg agaggcattc cattcactgg 180
ccctgccgac tgaccattgg ctccaatttg tctataagga ttgcagccta taaatcgatt 240
ctacaggaga gagttaaaaa gacttggaca gttgtggatg caaaaaccct aaaaaaagaa 300
gatatacaaa aagaaacagt ttattgctta aatgatgatg atgaaactga agttttaaaa 360
gaggatatta ttcaagggtt ccgctatgga agtgatatag ttcctttctc taaagtggat 420
gaggaacaaa tgaaatataa atcggagggg aagtgcttct ctgttttggg attttgtaaa 480
tcttctcagg gtcagagaag attcttcatg ggaaatcaag ttctaaaggc tttgccccaa 540
gagatgatga ggcag 555

<210> 381
<211> 406
<212> DNA
<213> Homo sapien

<400> 381
ctgcaccagg tgggcctcta ggtcccatta agcccattgg tccagggcca agtccaactc 60
ctttttccatc atactgagca gcaaagttcc caccgagacc aggggggcca ggaggaccag 120
gtggaccagg agggcctgtg ggaccatctt caccatctct gcctgggggg cctggtggac 180
ccctttctcc acgtggtcct ctatctccgg ctgggccctt tcttacagtt tcctcttgta 240
aagattggca tgttgctagg cataaggtta ctgcaagcag caacaaagtc cgcgtatcca 300
caaagctgag catgtctagc acttagacat gcagactcct tgtgtcgcag agcccctggg 360
tcaccggcgg aggtatcacc tggcgggcgc gggcatgcag tcgtgg 406

<210> 382
<211> 528
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(528)
<223> n = A,T,C or G

<400> 382

ctgagcagtt tgtgggtntn tcttcccgca agtttcagga agtattcaca aaagaaaaat 60
acatttttc ccccaggggt ggggcaagga cagtggagag agtgctagga aatgagtccc 120
ctgggaaagg ggaccgggcc gtgatgttaa atatctccgg ctcccaagtg actggatttg 180
cctaggacct tcagaccaac agacttcaga ccctcagacc tgccccgggg ccaggtggag 240
aaagtgaggg ccgtacaagg aagtgaaatt ctgagttgtt ggggctaagc ctgacccccct 300
ctccatgctc cccgccccaa cccactctgg cctcagtaga tttttttttc agttgtggtt 360
gttgcccagg ctggagtgca gtagcgccat cttggctcac tgcacctcca ccttccgggc 420
tcaagcgatt ctccagcctc agcctcctga gtagctagga ctgcaggtgc tccaccacgc 480
ccggctaatt tttgtatttt tagtagagat ggggtttccc catgttgg 528

<210> 383
<211> 335
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(335)
<223> n = A,T,C or G

<400> 383
ccatnttgag tctactcctg cgtcttgtgc cctagcaccc cgagaaccgt cagtttgagc 60
cagatggaag ctgagctgaa cacattacga tggatgatgg aaacataaga ctatcaagaa 120
atccaagtgg taatggcgca agtttattca gcatccggca atggacttat cgtagttggg 180
gaaacgggtg ttccgaataa tatcctggaa gttatcagga cacctatttt aaatataggc 240
ctgaattttg taaagtaata tttaaggtgg tccgtgataa ttaaataaaa tgcttaattc 300
atgtggcgaa aaaaaaaaaa naaaaaaaaa aaaaa 335

<210> 384
<211> 333
<212> DNA
<213> Homo sapien

<400> 384
agtccaatac ggctattggg gttgtagcag ctttcagagg aaattagtgg tctgggcttg 60
cctccagctc cccaggggca gccccagtag ctacactgtc cagacagcac aagaccaggc 120
tggtgtcacg tccatccgag cgctgcctca gggatcgata aagtttcact gcagaaagtc 180
tccactgcgg tatgctgaca tctgccctga accttcaccc tacagcatta caggctttaa 240
tcagattctg ctggaaagac acaggctgat ccacgtgacc tcttctgcct tcactgggct 300
ggggtgatcc ttggtgcctt tgtttccaca agg 333

<210> 385
<211> 343
<212> DNA
<213> Homo sapien

<400> 385
ctgtgacacc tcaggttgaa agggtcttcc tccttgaaca cccaccgagg ggcctggagc 60
aacagccagc cgatatggac ttctagctgc accgggtcac tgagggtgga gaggtttgtc 120
tggcacctgt actctccact gtcgtcgact gtggcagcgt caatgaagta gctcgaggcc 180
tggcttgaga tgaggctctc attgtgaaac cactgtgtgg aattgtcctc aggggagtag 240
gctccctggc acttcagagt cacactgtcc ttctcgagca ccctgtacca ttgaggctcc 300
aggaacacca cagcctttgg gagatcttca gtccgcatgc caa 343

<210> 386

<211> 244
<212> DNA
<213> Homo sapien

<400> 386
tattctttga ttcttggcaa ataggtgaga gaactaatag [illegible] [illegible] 60
aagtcaaaaa gtcggtaaca gaagaatgga atcagccaac ccacttgata agaaattgct 120
ccataaacca gcattgaact gattataaac ataagaacag agacggcaaa aagaacacag 180
gcattatcag ccattctctc agacgaatag taattaccga tgacttcata ctgaatgttg 240
acag 244

<210> 387
<211> 504
<212> DNA
<213> Homo sapien

<400> 387
atctggagtc cagcctcagg gatgcgctac tttccattct ctgcattgaa cattcgttct 60
gtcagcatcc gctccagctt cactgcatca gcggcaaact tgcggatccc gtcagagagc 120
ttctccacag ccatctggtc ctcgttgtgc aaccaacgga aagacttctc atccaggtgg 180
atttttttcca ggtcactggc ttgggccgcc ttggctgaga gcacaggcac cagcttggcg 240
ttgtcctgca gcagctctcc caggagcttg ggtgggatgg tgaggaagtc acagccggcc 300
agtgctttga tctcgcccgt gttgcggaag gaggcgccca tgacaatggt tttgtagcta 360
aacttcttgt agtagttgta gattttagtg acactcttta ccccagggtc ttccaggggc 420
tcataggatt tcttgtcggt gtttgccaca tgccaatcaa ggatgcgccc aacaaatggg 480
gagatgaggg tcacacccgc ctcg 504

<210> 388
<211> 450
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(450)
<223> n = A,T,C or G

<400> 388
gccaaagtgc tgcntgaatt ccactccctt ggttttcgcc tgcccagcgt tgctgtttgc 60
gtggagggtg gggggagctc agtggcaggg aatcagcggt ccgtggggtc gtggggacgg 120
gaacatgtgc ccgaccgctc catcccctcc tcctccttag gatgcataac ctaccttgtc 180
tttttttttt taaattttnt ttccaggtan agtagctntt tgtacataaa naatacttga 240
aaaattaatt gtatgatgta tgaaaanaca nagtctccta gttttgtatn ttgttgtatg 300
actgccatga gttccaccaa aaagccactn tattttggtc tntgtgacat tttaaatgcg 360
tgacaaaagt gagcaaataa agngaggaan aaatntatnt atganataat atanattgta 420
ttgaaatcta aaaaaaaaaa aaaaaaaaaa 450

<210> 389
<211> 297
<212> DNA
<213> Homo sapien

<400> 389
cctgcacttg aacatggctt tggttttaag caacttctct accctgaccc tcctcctggg 60
acagcgtttc gggaggtttc ttggcctcac tgagagggat gtggagctgc tgtaccccgt 120

caaggagaag gtattctaca gcctgatgag ggagagcggc tacatgcaca tccagtgcac 180
caagcctgac accgtaggct ctgctctgaa tgactctcct gtgggtctgg ctgcctatat 240
tctagagaag ttttccacct ggaccaatac ggaattccga tacctggagg atggagg 297

<210> 390
<211> 223
<212> DNA
<213> Homo sapien

<400> 390
ctgggctgga gagttggtgc tggcaaaaca gtccttcccc tggggccggt tcttacccag 60
gtccagagaa accaacgcgg gatgtcagac ttcaccaaaa ggactttctg gttgcccctg 120
gctggcttcc tggaggcgtt cgcctctagt ttctcaggga tggagcgaga gcccagccag 180
agaacagtaa gaggagctgc tctcctatct gcactcaccc agg 223

<210> 391
<211> 365
<212> DNA
<213> Homo sapien

<400> 391
ctgaggaaga aatgaaaaaa gaccctgtcc ctcatggccc gcccactggc ctcctgtgaa 60
ctctgtcctg ttgccaaccc cagatgaagt cagccaaaaa gtgctttcca catcctctct 120
ctggggctgc ccagcctgac cgtaggggat ccactggcag agccaaggtg gatgctggtg 180
cctgaagctg gaagccagca ggacatgaga cccctcctgt agcaggaagt ggttctagaa 240
ctcccagcag aacagaacgg aaaaggagct gattggggat agaatgagtt ctgctaaaca 300
gccagatgct ctgagagagg tgacactgga ctgtctcgga ggtgtgtgca gatggctaca 360
ggtgg 365

<210> 392
<211> 302
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(302)
<223> n = A,T,C or G

<400> 392
ccaagagcta caatgagcag cgcatcanga cagaacgtgc aggtttttga gttccagttg 60
actgcagagg acatgaaagc catagatggc ctagacagaa atctccacta ttttaacagt 120
gatagttttg ctagccaccc taattatcca tattcagatg aatattaaca tggagagctt 180
tgcctgatgt ctaccagaag ccctgtgtgt ggatggtgac gcagaggacg tctctatgcc 240
ggtgactgga catatcacct ctacttaaat ccgtcctgtt tagcgacttc agtcaactac 300
ag 302

<210> 393
<211> 213
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(213)

<223> n = A,T,C or G

<400> 393
ccaataatca agnacaaana ctggatttga ggatggatca gttctgaaac agtttctttc 60
tgaaacagag aaaatgtccc ctgaagacag agcaaaatgc tttggaaaga atgaggccat 120
acaggcagcc [illegible] [illegible] [illegible] cgggtagatg acaaggtgaa 180
tttccatttt attctgttta acaacgtgga tgg 213

<210> 394
<211> 334
<212> DNA
<213> Homo sapien

<400> 394
cctacccata atccagagag gcttgcccag aggaggacta cgtgggggac gtgccaccag 60
aaccctactt gggggcggga tgtcactccg aggtcaaaac ctgctccgag gtggacgagc 120
cgtagctccc cgaatgggct taagaagagg tggtgttcga ggtcgtggag gtcctgggag 180
agggggccta gggcgtggag ctatgggtcg tggcggaatc ggtggtagag gtcggggtat 240
gataggtcgg ggaagagggg gctttggagg ccgaggccga ggccgtggac gagggagagg 300
tgcccttgct cgccctgtat tgaccaagga gcag 334

<210> 395
<211> 174
<212> DNA
<213> Homo sapien

<400> 395
ccagatgagg aaaaaaatta ggaaggagat gaagttttcc aaatttcatg gtatatgctg 60
cacttcccca accttcactc tccatgtagc ctactgggtc tactattcca caaagtggct 120
caacctccaa atgacctctg gtttacccct attaaaatcc caaaggactt tcag 174

<210> 396
<211> 140
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(140)
<223> n = A,T,C or G

<400> 396
ctgcaaagcc ttgtgtaacn ttctccagca tttggaccca gtacgtgaaa gcccacaaca 60
cgttcattgt ctttagtatt acagattatt tttgcataac atttgttgtt atctcttgac 120
ggaatcgtcc attccaatgg 140

<210> 397
<211> 318
<212> DNA
<213> Homo sapien

<400> 397
cctcgcctgg agggcccccg ggcagcacag ggaggacgag cttgtccagc agagggtctg 60
gcagagggtc ccgcagaggt ttgggcaggg ggtctgacat ccctggctcc tgctctggct 120
ctggctgccg ggatttgcac aggcccaggt gcatacagat gccgtttgag tcagtctggt 180

tctggaagta gtcgatgacc agggggaagt agtcgtcaag cacttggttg cactggggca 240
tgagcagctt caaggggagg acgttgcact cctgctccag gaacttcctc atcgtgtcct 300
ggaaaatggc ctccttgg 318

<210> 398
<211> 517
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(517)
<223> n = A,T,C or G

<400> 398
ccttncttcg ccatccattc atcgaccctc tccagcactt gctgcaggct tggctgacca 60
tccaccatgg cttgaataat cccggtgagc tctgtacaga atggggtaag ctgtggatgg 120
actacaggct ggacatacat gtgaaaggta gactcaatct ccatggtccg gccatttagc 180
tttaggatgg ggaactcgat gatttcctga ggatgaatct gtggcttgtc gcacgtggcc 240
tcaaagtcca gcactaaaaa gtagtgatac ctctggagag ggaaggacac cattgccgcc 300
atggatgcgc caaagccgtg ggccgccagc tttctggtgg atatggagca gaactccgga 360
acaccacagg gagaaaataa gtgggagccc agcacttttc ttgctcttga aagtaaatac 420
gaagaaaatc gagctgctcc agtctgtaaa ggtgctagca ttgaacatcc agaagcatct 480
aaaactctcc ttacttcgaa gatgccaaga ccggcag 517

<210> 399
<211> 329
<212> DNA
<213> Homo sapien

<400> 399
ccaacctcag gcaacgggtg gagcagtttg ccagggcctt ccccatgcct ggttttgatg 60
agcattgaag gcacctggga aatgaggccc acagactcaa agttactctc cttcccccta 120
cctgggccag tgaaatagaa agcctttcta tttttggtg cgggagggaa gacctctcac 180
ttagggcaag agccaggtat agtctccctt cccagaattt gtaactgaga agatcttttc 240
tttttccttt tttcggtaac aagacttaga aggagggccc aggcactttc tgtttgaacc 300
cctgtcatga tcacagtgtc agagacgcg 329

<210> 400
<211> 451
<212> DNA
<213> Homo sapien

<400> 400
ctggcttcac tgctcaggtg attatcctga accatccagg ccaaataagc gccggctatg 60
cccctgtatt ggattgccac acggctcaca ttgcatgcaa gtttgctgag ctgaaggaaa 120
agattgatcg ccgttctggt aaaaagctgg aagatggccc taaattcttg aagtctggtg 180
atgctgccat tgttgatatg gttcctggca agcccatgtg tgttgagagc ttctcagact 240
atccaccttt gggtcgcttt gctgttcgtg atatgagaca gacagttgcg gtgggtgtca 300
tcaaagcagt ggacaagaag ctgctggagc tggcaaggtc accaagtctg cccagaaagc 360
tcagaagcta aatgaatatt atccctaata cctgccaccc cactcttaat cagtggtgga 420
agaacggctc agaactgttt gtttcaattg g 451

<210> 401
<211> 180

<212> DNA
<213> Homo sapien

<400> 401
ccaggaagca ggccaggga ttggcagcac tgcccagcac cacagccagg tggtaggcca 60
gacgcccgca gggtaagcag [illegible] ttggtcagcg 120
cgttggtggc ggccaacagg cccagcaggc aggcactgcg ggctgataga agctgatagg 180

<210> 402
<211> 385
<212> DNA
<213> Homo sapien

<400> 402
ccaggccacc tgtgcggggc tcctcgatgt ggaaggttcg ggtgaggaga ttgtagaagg 60
agccgtagca cacggccacc acagtgcacg tgaggcagat cacgttgtag ggcatgctga 120
agtccggtgt cggcaggttc accagcagcg gctccgtgta gagccgcaca aagtagttag 180
agccatcaga gactgggaac aggctgttga agaggggact ctcttcccag tccactggct 240
tggctgctac catgctgggc acaagggcgc tgaggacaga tgggctgaca tagaagccat 300
ggttaggatc tggcgtgtac tcggtccact tcagcagcgc ccgctcaaac tggatggaaa 360
ccttggtgac tgagttggcc ggcag 385

<210> 403
<211> 440
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(440)
<223> n = A,T,C or G

<400> 403
ctgtttaacc agnaacccgg ggggtcaccc cccacagaat gtacatgaaa cactagagga 60
ctgcatgttt ttccctgaga gaagcgtaag acaaacagaa gtcaaaaagt agtcactggg 120
agcgccatcc ttctaagcaa atcctccctt tccctttgg aggatttgcc cgaactacgt 180
agccagtcag cacttagacc acctgcctcc tccccccccct ataaacccac cactcccctc 240
ctcctttccc aaaccacttg gggtgtccta agccctcact gccccaagcc caaaatatca 300
gctaagatcc ttgtcagtat ttccacagtc atacctaatg aattgggaag tggggcccct 360
aaaaaccaat tcacatctat gcacttgttt ccactggatt tggcagacag gctttttag 420
ttaccgtaac cagatcttaa 440

<210> 404
<211> 239
<212> DNA
<213> Homo sapien

<400> 404
cctacgaaaa actcccggcc ggtgaagaga acgtcagtgc catccagcgt cgcgttctcg 60
tctcctattt ccacaattcg gagccccagg tcttgcaggg ctttgcggac tccatcgacc 120
tctggcctac gagcggggct ccagggccgc gtgattaggg ccgtgtcccc ttggatcacg 180
gccgtgtcgc caagcagcgg tcccagcggc aatgactcct caggtggcag ttctagcag 239

<210> 405
<211> 261

<212> DNA
<213> Homo sapien

<400> 405
ctggagaggc agcccttcac cggatgccca gctccgtgcc cctgcgggcc ccagcacagt 60
ttaccttctc cccccacggc ggtcccatct actctgtgag ctgttccccc ttccacagga 120
atctcttcct gagcgctggg actgacgggc atgtccacct gtactccatg ctgcaggccc 180
ctcccttgac ttcgctgcag ctctccctca agtatctgtt tgctgtgcgc tggtccccag 240
tgcggcccct ggtttttgca g 261

<210> 406
<211> 641
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(641)
<223> n = A,T,C or G

<400> 406
ctgctcccgg gcntggtggc agcaagtaga catcgggcct gtgcagggcc acccccttgg 60
gccgggagat ggtctgcttc agtggcgagg gcaggtctgt gtgggtcacg gtgcacgtga 120
acctctcccc ggaattccag tcatcctcgc agatgctggc ctcacccacg gcgctgaaag 180
tggcattggg gtggctctcg gagatgttgg tgtgggtttt cacagcttcg ccattctggc 240
gggtccagga gatggtcacg ctgtcatagg tggtcaggtc tgtgaccagg caggtcaact 300
tggtggactt ggtgaggaag atgctggcaa aggatggggg gatggcgaag acccggatgg 360
ctgtgtcttg atcggggaca cacatggagg acgcattctg ctggaaggtc aggcccctgt 420
gatccacgcg gcaggtgaac atgctctggc tgagccagtc gctctctttg atggtcagtg 480
tgctggtcac cttgtaggtc gtgggcccag actctttggc ctcagcctgc acctggtccg 540
tggtgacgcc agaccccacc tgcttcccct cgcgcagcca ggacacctga atctgccggg 600
gactgaaacc cgtggcctgg cagatgagct tggacttgcg g 641

<210> 407
<211> 173
<212> DNA
<213> Homo sapien

<400> 407
ccaggtactg gcacaatcat gtctggatgg gggtggtggt gtcctgtagg cagagaaaca 60
ggaaattgtc gtagtcagta tcgagcagcg tggcctcgtt cgccaccgta tagttgatct 120
tgaacttctt tggattctca gtcttctctc caaggacctt cttctcaaca cag 173

<210> 408
<211> 165
<212> DNA
<213> Homo sapien

<400> 408
ccactgtctg cagccatggc agaaagtgct caaagtccag caccttcaca ttcatctcat 60
cactcttggg gttccccagg accttgagca cctcggcgtt ggtagggttc tggcccaggg 120
ccctcatcac atccccacac tggctgtaca ggatcttgcc atcac 165

<210> 409
<211> 329

<212> DNA
<213> Homo sapien

<400> 409
ctgtagcttc tgtgggactt ccactgctca ggcgtcaggc tcagatagct gctggccgcg 60
tacttgttgt tgctttgctt ggagggtgtg gtggcctccc [illegible] [illegible] 120
ctatctgcct tccaggccac tgtcacggct cccgggtaga agtcacctat gagacacacc 180
agtgtggcct tgttggcttg aagctcctca gaggagggcg ggaacagagt gaccgagggg 240
gcagccttgg gctgaccaag gacggtcagc ttggtccctc cgccaaatac cgccggataa 300
gcaccactgt tgtctgctga ttgacagaa 329

<210> 410
<211> 235
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(235)
<223> n = A,T,C or G

<400> 410
ccatcagnga gaaaggtgtt tgtcagttgt ttcacaaacc agattgagga ggacaaactg 60
ctctgccaat ttctggattt ctttattttc agcaaacact ttctttaaag cttgactgtg 120
tgggcactca tccaagtgat gaataatcat caagggtttg ttgcttgtct tggatttata 180
tagagctttt tcatatgtct gagtccagat gagttggtca ccccaacctc tggag 235

<210> 411
<211> 294
<212> DNA
<213> Homo sapien

<400> 411
aattaaggga agatgaagat gataaaacag ttttggatct tgctgtggtt ttgtttgaaa 60
cagcaacgct tcggtcaggg tatcttttac cagacactaa agcatatgga gatagaatag 120
aaagaatgct tcgcctcagt ttgaacattg accctgatgc aaaggtggaa gaagagcctg 180
aagaagaacc tgaagagaca gcagaagaca caacagaaga cacagagcaa gacgaagatg 240
aagaaatgga tgtgggaaca gatgaagaag aagaaacagc aaaggaatct acag 294

<210> 412
<211> 433
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(433)
<223> n = A,T,C or G

<400> 412
cctgagaagc cagaggcagg tggagagggg gtggaaagtg agcagcgggc tgggctggag 60
ccgcacacgc tctcctccca tgttaaatag cacctttaga aaaattcaca agtccccatc 120
cacaaaaaaa aaaanaanaa aaatttcagg gantaaaaat anactttgaa caaaaaggaa 180
catttgntgg cctggggggg catctnantt tntntagcnc cagngattcc ctccccnccc 240
cacccatcac atanatgtaa cacctttggt ntaaaatggg gagccgtttc caccntgccc 300

ccntccccgc ccccaggcag ttgccccggn gacacntcaa gacaggancg aggtagtntt 360
tcancancac agttncacaa ggaacagaac agtntctccc gcccagccct gcggcacaag 420
ggattgacac gcn 433

<210> 413
<211> 494
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(494)
<223> n = A,T,C or G

<400> 413
ccttatttct cttgtcnctt cgtacaggga ggaatttgaa gtagatagaa accgacctgg 60
attactccgg tctgaactca gatcacgtag gactttaatc gttgaacaaa cgaaccttta 120
atagcggctg caccatcggg atgtcctgat ccaacatcga ggtcgtaaac cctattgttg 180
atatggactc tagaatagga ttgcgctgtt atccctaggg taacttgttc cgttggtcaa 240
gttattggat caattgagta tagtagttcg ctttgactgg tgaagtctta gcatgtactg 300
ctcggaggtt gggttctgct ccgaggtcgc cccaaccgaa atttttaatg caggtttggt 360
agtttaggac ctgtgggttt gttaggtact gtttgcatta ataaattaaa gctccatagg 420
gtcttctcgt cttgctgtgt tatgcccgcc tcttcacggg caggtcaatt tcactggtta 480
aaagtaagag acag 494

<210> 414
<211> 294
<212> DNA
<213> Homo sapien

<400> 414
ctgggcggat agcaccgggc atattttgga atggatgagg tctggcaccc tgagcagtcc 60
agcgaggact tggtcttagt tgagcaattt ggctaggagg atagtatgca gcacggttct 120
gagtctgtgg gatagctgcc atgaagtaac ctgaaggagg tgctggctgg taggggttga 180
ttacagggtt gggaacagct cgtacacctg ccattctctg catatactgg ttagtgaggt 240
gagcctggcg ctcttctttg cgctgagcta aagctacata caatggcctt gtgg 294

<210> 415
<211> 421
<212> DNA
<213> Homo sapien

<400> 415
ccttgcccct gccctcccac gaatggttaa tatatatgta gatatatatt ttagcagtga 60
cattcccaga gagccccaga gctctcaagc tcctttctgt cagggtgggg ggttcagcct 120
gtcctgtcac ctctgaggtg cctgctggca tcctctcccc catgcttact aatacattcc 180
cttccccata gccatcaaaa ctggaccaac tggcctcttc ctttcccctg ggaccaaaat 240
ttaggggcct cagtccctca ccgccatgcc ctggcctatt ctgtctctcc ttcttccccc 300
tggcctgttc tgtctctgag ctctgtgtcc tccgttcatt ccatggctgg gagtcactga 360
tgctgcctct gccttctgat gctggactgg ccttgcttct acaagtatgc ttctcccaca 420
g 421

<210> 416
<211> 342
<212> DNA

<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(342)
<223> n = A,T,C or G

<400> 416
ccactttctt tcccacnctg gaaggcggca tctatgactt cattggggag ttcatgaagg 60
ccagcgtgga tgtggcagac ctgataggtc taaaccttgt catgtcccgg aatgccggca 120
agggagagta caagatcatg gttgctgccc tgggctgggc cactgctgag cttattatgt 180
cccgctgcac tcccctatgg gtcggagccc ggggcattga gtttgactgg aagtacatcc 240
agatgagcat agactccaac atcagtctgg tccattacat cgtcgcgtct gctcaggtct 300
ggatgataac acgctatgat ctgtaccaca ccttccggcc gg 342

<210> 417
<211> 389
<212> DNA
<213> Homo sapien

<400> 417
tattaattag gttcttaaga catttagaac accaatttgt gaggataaat tccattcgtc 60
agagcaaaca cagatcgcag gtagccctgg agctgaggaa tagctttgat ttttggtaaa 120
atttgtgagt ccacagcttt ctgatcaatc ttgcgctgct ccgtaatctc atatttctct 180
ttttctgtgt cgaagatctc accttcctgg tgtctgggct tccgcagctt cttcttcttg 240
aagtaagcat cagtaagatg ttttgggatt tttacattgc tgatatcgat tttggttgaa 300
gtggcaatga caaatttctg gtgtgttctt cgtagaggaa ctcgattgag gaccagaggt 360
ccagtcacaa gtaataagcc actagccag 389

<210> 418
<211> 343
<212> DNA
<213> Homo sapien

<400> 418
gtgggaggga gccaggttgg gatggaggga gtttacagga agcagacagg gccaacgtcg 60
aagccgaatt cctggtctgg ggcaccaacg tccaaggggg ccacatcgat gatgggcagg 120
cgggaggtct tggtggtttt gtattcaatc actgtcttgc cccaggctcc ggtgtgactc 180
gtgcagccat cgacagtgac gctgtaggtg aagcggctgt tgccctcggc gcggatctcg 240
atctcgttgg agccctggag gagcagggcc ttcttgaggt tgccagtctg ctggtccatg 300
taggccacgc tgtttttgca gtggtaggtg atgttctggg agg 343

<210> 419
<211> 255
<212> DNA
<213> Homo sapien

<400> 419
cctagcaaga gaatcaccaa atttatggag agttaacagg ggtttaacag gaaggaagtg 60
cctttagtaa gttctcaagc cagaggctgg aggcagcagc taaatcagag gacagcatcc 120
tcagtgaaag tgagccattc ggggtggcat gtcactccag gaataaacac aacttagaaa 180
caaatgattt cgtaggatag cacagtgaca tggtgcactg tgaacctgag gccactgtgt 240
caaactgtgc actgg 255

<210> 420

<211> 261
<212> DNA
<213> Homo sapien

<400> 420
cttctgatga taaccaaccc ctagctacca ctctgtattc atcaggggag gggtataaac 60
cccacatgca agaagaaccc ttgcccccag tgtcaaatgg gatggggatg ctagagttat 120
agtaaagggg aaaccctatg taagctgtta acagagttca caggggtagg gataacccct 180
gttctccagc tccaaaatgt gctcactttc ccagcttctt catccgttca tcaatgctgg 240
caaagttccc ctcaactgtg g 261

<210> 421
<211> 179
<212> DNA
<213> Homo sapien

<400> 421
ccttcctgtt gttgtttcaa atgctgcttg atttctcgta acagatctgc atctatgtaa 60
tacctttctt cagatctgac tgctccaaaa tgattctgca tcctgatttg agacatcaat 120
tcatttagtc ggcccttgaa ctgagtaggt gcatttagtt caccctgaat cgtatccag 179

<210> 422
<211> 424
<212> DNA
<213> Homo sapien

<400> 422
cgaggtccaa atctgatctg cagatgcaga agattcgaca gaagctgcag actaaacagg 60
ctgccatgga gaggtctgga aaagctaagc aactgcgagc acttaggaaa tacgggaaga 120
aggtgcaaac ggaggttctt cagaagaggc agcaggagaa agcccatatg atgaatgcta 180
ttaagaaata tcagaaaggc ttctctgata aactggattt ccttgaggga gatcagaaac 240
ctctggcaca gcacaagaag gcaggagcca aaggccagca gatgaggaag ggcccagtg 300
ctaaacgacg gtataaaaac cagaagtttg gttttggtgg aaagaagaaa ggctcaaagt 360
ggaacactcg ggagagctat gatgatgtat ctagcttccg ggccaagaca gctcatggca 420
gagg 424

<210> 423
<211> 256
<212> DNA
<213> Homo sapien

<400> 423
ctgtggccta gggctacctc aagactcacc tcatccttac cgcacattta aggcgccatt 60
gcttttggga gactggaaaa gggaaggtga ctgaaggctg tcaggattct tcaaggagaa 120
tgaatactgg gaatcaagac aagactatac cttatccata ggcgcaggtg cacaggggga 180
ggccataaag atcaaacatg catggatggg tcctcacgca gacacaccca cagaaggaca 240
ctagcctgtg cacgcg 256

<210> 424
<211> 330
<212> DNA
<213> Homo sapien

<400> 424
ccagccgcat gggagtggag gcagtcatcg ccttgctaga ggccaccccg gacaccccag 60

cttgcgtcgt gtcactgaac gggaaccacg ccgtgcgcct gccgctgatg gagtgcgtgc 120
agatgactca ggatgtgcag aaggcgatgg acgagaggag atttcaagat gcggttcgac 180
tccgagggag gagctttgcg ggcaacctga acacctacaa gcgacttgcc atcaagctgc 240
cggatgatca gatcccaaag accaattgca acgtagctgt catcaacgtg ggggcacccg 300
cggctgggat gaacgcggcc gtacgctcag 330

<210> 425
<211> 333
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(333)
<223> n = A,T,C or G

<400> 425
ctgctccatg gnctcaaagt cagcaccacc cacacccaca atgatcactg acatgggcag 60
gttcgaggca cgcaccacag cctcacgtgt ggcttccaca tccgtcacag caccatcagt 120
cagnagaaac agnatgaagt attgngaggc antcccctga tgtgcagcct gggctgcaaa 180
cctggacctg cccgggcggc cgctcgaaag ggcgaattcc agcacactgg cggccgttac 240
tagnggatnc aganctcggt acnaagcttg gcagtaatca tggtcatagc tgtttcctgt 300
gagcggntgg gatgaacgcg gccgtacgct cat 333

<210> 426
<211> 411
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(411)
<223> n = A,T,C or G

<400> 426
gggtgttcat catgaggatt gcttctgcca tggagctgat ggacgtgggc aggttgctga 60
gaaggtgggg tggaagtgag tgccggggt gggtgagtgc cctggtcttg ttcatagggg 120
agcctttccc tagcagtgga acgctgtggt cattttctct agcatattcc cttgggaagt 180
ctagatttgc tattaatctg gctgagaatc taagttctgt gccttagaga cagtttgcac 240
tttcccatat tgtgcctggg acagccatat gatttttttt cccaccaaac aagtatgcaa 300
acagaaacca gttcaaaggg ggatggtgta aaagatgagg cagtanaaat gcctttgaat 360
ggttttctgt agctaattct ctttaaattt tgtcctgctt tttttcttta t 411

<210> 427
<211> 450
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(450)
<223> n = A,T,C or G

<400> 427
acgtgtacaa gtttgaactg gatacctctg aaagaaagat tgaatttgac tctgcctctg 60

gcacctacac tctctactta atcattggag atgccacttt gaagaaccca atcctctgga 120
atgtggctga tgtggncatc aagttccctg aggaagaagc tccctcgact gtcttgtccc 180
agaacctttt cactccaaaa caggaaattc agcacctgtt ccgcgagcct gagaagaggc 240
cccccaccgt ggtgtccaat acattcactg ccctgatcct ctcgccgttg cttctgctct 300
tcgctctgtg gatccggatt ggtgccaatg tctccaactt cacttttgct cctagcacga 360
ttatatttca cctgggacat gctgctatgc tgggactcat gtatgtctac tggactcagc 420
tcaacatgtt ccagaccttg aagtacctgg 450

<210> 428
<211> 377
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(377)
<223> n = A,T,C or G

<400> 428
cagggctata gtgcgctatg ttgatctggt gttcatgcta agttccgcat caatatggtg 60
acttcttggg agtgggggac caccaggttg cctaaggagg ggtgaacctg cctacgttgg 120
aaatagagct ggncaaaact cctgtgctca tcagtagtag aattgcacct gtgaatagcc 180
nccgccctcc agcatgggca acataacaag accctgcctc ttaaagataa aaattggaaa 240
acactngtag gaaaaaaagg gtgnttggtc taaataaatn tggattgggn ataaatgacn 300
caaaactatc atgaatttga aagcntttct aatttcttga aagtctgaaa aaagttaaan 360
cncaatttta tctnaaa 377

<210> 429
<211> 206
<212> DNA
<213> Homo sapien

<400> 429
gttgctcctc caaagaaggt tggcttcaag gccgtgtcca gggacccacg agcagaggca 60
ctggggggca agggatctcc aagggggcaa gggatcccta aaggggtag ctcacaggtg 120
agggggttta gggcccctct agggagcgcc tgaggccata cattcaagag tgtccctggt 180
gaggcccagg gaagagccag gactgg 206

<210> 430
<211> 473
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(473)
<223> n = A,T,C or G

<400> 430
ccttatttnt cttgtccttt cgtacaggga ggaatttgaa gtagatagaa accgacctgg 60
attactccgg tctgaactca gatcacgtag gactttaatc gttgaacaaa cgaaccttta 120
atagcggctg caccatcggg atgtcctgat ccaacatcga ggtcgtaaac cctattgttg 180
atatggactc tagaatagga ttgcgctgtt atccctaggg taacttgttc cgttggtcaa 240
gttattggat caattgagta tagtagttcg ctttgactgg tgaagtctta gcatgtactg 300
ctcggaggtt gggttctgct ccgaggtcnc cccanccgaa atttttaatg caggtttggt 360

agntnaggac ctgtgggttt gttaggtact gggtgcatta ataaattaaa gctccatagg 420
gtcttctcgt cttgctgtgt tatgcccncc tcttcacggg caggtcaatt tca 473

<210> 431
<211> 215
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(215)
<223> n = A,T,C or G

<400> 431
cctgtatnaa gctanaaaaa gactaccagc ccgggatcac cttcatcgtg gtgcagaaga 60
ggcaccacac ccggctcttc tgcactgaca agaacgagcg ggttgggaaa agtggaaaca 120
ttccagcagg cacgactgtg gacacgaaaa tcacccaccc caccgagttc gacttctacc 180
tgtgtagtca cgctggcatc caggggacaa gcagg 215

<210> 432
<211> 391
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(391)
<223> n = A,T,C or G

<400> 432
ccagcactgc cacaaacttt ttcagggcca ccaggcgctg cccttccagg accgggaacc 60
tgcccacttc tatccgcagg atgtagtgca gtgcagattc caggtcagcc atgtagatcc 120
tggagcgatc tgccaatttc caaacagtgg gagctatctt gttagcagtg gttggtgcaa 180
ctgtggtctg ggcagcctcc ctggtgagcc cagagagtct ctgcaggtaa gcggtataga 240
aggacctgga ttccatgagc acggggactc gggagacgga gccattccgg aacagcaggt 300
agcaagaggg gaagtcggtg acaccaaact ttctcaccac attggcctct gtgttcagca 360
ccctgcgcac cgccacncct ttgtgctggg a 391

<210> 433
<211> 420
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(420)
<223> n = A,T,C or G

<400> 433
ctgtagcttc tgtgggactt ccactgctca ggcgtcaggc tcagatagct gctggctgcg 60
tacttgttgt tgctttgttt ggagggtgtg gtggtctcca ctcccgcctt gacggggctg 120
ctatctgcct tccaggccac tgtcacggct cccgggtaga agtcacttat gagacacacc 180
agtgtggcct tgttggcttg aagctcctca gaggagggcg ggaacagagt gaccgagggg 240
gcagccttgg gctgacgtag gacggttagt ttggnccctc cgccgaatgc cgcanttcta 300
ctgtcccaca cctgacagta atagtcancc tcatcttcgg cttgggctct gctgatggtc 360

agggtggccc gtgntccccg agttggagcc agggaatcnc tcagggatcc canagggccn 420

<210> 434
<211> 239
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(239)
<223> n = A,T,C or G

<400> 434
ccaaccanga gagaagggat cgcctggtgc ccagggccca ccaggagctc caggcccact 60
tgggattgct gggatcactg gagcacgggg tcttgcagga ccaccaggca tgccaggtcc 120
taggggaagc cctggccctc agggtgtcaa gggtgaaagt gggaaaccag gagctaacgg 180
tctcagtgga gaacgtggnc cccctggacc ccagggtctt cctggtctgg ctggtncag 239

<210> 435
<211> 415
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(415)
<223> n = A,T,C or G

<400> 435
ctgtccaatg gcaacaggac cctcactcta ttcaatgtca caagaaatga cgcaagagcc 60
tatgtatgtg gaatccanaa ctcagtgagt gcaaaccgca gtgacccagt caccctggat 120
gtcctctatg ggccggacac ccccatcatt tccccccag actcgtctta cctttcggga 180
gcaaacctca acctctcctg ccactcggcc tctaacccat ccccncanta ttcttggcgt 240
atcaatggga taccgcagca acacacacaa gttctnttta tcgccaaaat cacgccaaat 300
aataacggga cctatgcctg tttagggntn taacttggnt actggccgca anaattccat 360
agtcaagagc atcacagnct ctgcatntgg aacttctcct ggctntcaga cctgn 415

<210> 436
<211> 152
<212> DNA
<213> Homo sapien

<400> 436
ccaggattga caggccatcc attcacagcc aggagatgct gggccagtcc ctccaagagg 60
tctccgtcat ggcagtgatg aaaacctaac agggtggccc cctgtgccag ctcaggtgac 120
tggagcccga gggcctgaca ggttcccagc ag 152

<210> 437
<211> 174
<212> DNA
<213> Homo sapien

<400> 437
ccaggtactg gcacatcatg ctctggatgg gggtggtggt gtcctgtaag cagagaaaca 60
ggaaattgtc gtagtcagta tcgagcagct gtggcctcgt tcgccaccgt atagttgatc 120

ttgaacttct ttggattctc agtcttctct ccaaggacct tcttctcaac acag 174

<210> 438
<211> 485
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(485)
<223> n = A,T,C or G

<400> 438
ccacggccct ctcggccctc tcgctgggag cggagcagcg aacagaatcc atcattcacc 60
gggctctcta ctatgacttg atcagcagcc cagacatcca tggtacctat aaggagctcc 120
ttgacacggt caccgccccc cagaagaacc tcaagagtgc ctcccggatc gtctttgaga 180
agaagctgcg cataaaatcc agctttgtgg cacctctgga aaagtcatat gggaccaggc 240
ccagagtcct gacgggcaac cctcgcttgg acctgcaaga gatcaacaac tgggtgcagg 300
cgcagatgaa agggaagctc gccnggtcca caaaggaaat tcccgatgag atcagcattc 360
tccttctcgg ngtggcgcac ttcaaggggc agngggtaac aaagtttgac tncagaaang 420
acttccctcg aggatttcta cttggatgaa gagaggaccg tgagggtccc catgatgtcg 480
gaccc 485

<210> 439
<211> 317
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(317)
<223> n = A,T,C or G

<400> 439
gggccgtctt cccctccatc gtggggcgcc ccaggcacca gggcagtgat ggtgggcatg 60
ggtcagaagg attcctatgt gggcgacgag gcccagagca agagaggcat cctcaccctg 120
aagtacccca tcgagcacgg catcgncacc aactgggacg acatggagaa aatctggcac 180
cacaccttct acaatgagct gcgtgtggct cccgaggagc accccgtgct gctgaccgag 240
gcccccctga accccaaggc caaccgcnag aagatgaccc agatcatgtt tgagaccttc 300
agcaccccag ccatgta 317

<210> 440
<211> 338
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(338)
<223> n = A,T,C or G

<400> 440
ccanaaagac ttcccaggga agatgcttgg ctctctgctc caaggtgggc catggtatag 60
ggccctcgaa gggcttgtgg ctggggtgat cccagggggc attgctcaaa gtgcacagga 120
ggtggcagca gggtcaggcg agttcctgtt ccagggacat caggagggag ggtagaagcc 180

tagggagtgt gcgaggctgc tgggatgagg gagctcaggg gctaccagct aaccagcctc 240
agctcaatgg tttctccatc cttgggtctg tagtcagcaa taccttgcaa cagtggggtg 300
ttggggtctc ggagaagctg ccagaactcc ctttctcc 338

<210> 441
<211> 505
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(505)
<223> n = A,T,C or G

<400> 441
ccacacagan tcaccaagcc acagacttgt cttccacaag cacgttctta tcttagccac 60
gaagtgacca agccacacgt actaaaggtt gaactcaaag atatgtacag ggtattaaac 120
aaataccaag gggaacagtt aacttcaata caaggtcgaa atcagcaaca agttctacaa 180
tccagngctg atatcagata caagcttcaa ggacaatttc ttttcgaagg cttattccag 240
tttcgngagg ctagcatgag gtgtgtgcat ttgccagggg caaatttcta ttctcaatta 300
acccatgcag caaatgctac ncatggtgcn gagtccgttt agaagcattt gcggtggacg 360
atggaggggc ccgactcgtc ttactcctgc ttgctaatcc acnngngctg gaaggnggac 420
agtgaggcca cggatggagc caccnatcca caccgagtnc ttgcgctctg gggtgcgat 480
natnttgatc ttcatggtgc tgggc 505

<210> 442
<211> 386
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(386)
<223> n = A,T,C or G

<400> 442
cgccaggtga tacctccgcc ggtgacccag gggctctgcg acacaaggag tctgcatgtc 60
taagtgctag acatgctcag ctttgtggat acgcggactt tgttgctgct tgcagtaacc 120
ttatgcctag caacatgcca atctttacaa gaggaaaccg taagaaaggg cccagccgga 180
gatagaggac cacgtggaga aaggggtcca ccaggccccc caggcagaga tggtgaagat 240
ggtcccacag gccctcctgg tccacctggt cctcctggcc cccctggtct cgatgggaac 300
tttgctgctc agtatgatgg aaaaggaggg nggacttggc cctggaccaa tgggcttaat 360
gggacctana ggcccacctg gtgcag 386

<210> 443
<211> 404
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(404)
<223> n = A,T,C or G

<400> 443

```
cctccctctc agagcttgcc ccagggactc tctggccctc agggttcaat gtattctgac      60
caaggccaag ctttcctggg gctcagggaa aatcacactt tgctacccga agctgtatcc     120
cctcagatgc caggaaggcc gtgatcatct gactccaccc tcctgagaca cattctctcc     180
ctgactgtcc tgttctaagt cagcggagca ccttaggatg gaggggtgga ggcgaggcca     240
ngatgcagcc tctgtgaaca ggtgcctgga ggctgggaaa tgaccctgag agggcaggac     300
acagcnaccg ngggcttaag gtgaggnggg agagcaagnt tggcccactt [illegible]     360
gntcagagcc anccccctaac atggngggca tttattcatt tcgg                     404
```

<210> 444
<211> 318
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(318)
<223> n = A,T,C or G

<400> 444

```
catgggctat agtgcgctat gttgatctgg tgttcatgct aagttccgca tcaatatngc      60
gacttcttng gagtggggga ccaccangtt gcctaaggag gggtgaacct gcctacgttg     120
gaaatagagc tggtcaaaac tcctgtgctc atcagtagta gaattgcacc tgtgaatagc     180
caccgccctc cagcntgggc aacatagcaa gaccctgcct cttaagataa aaattggaaa     240
acactggtan gaaaaaaagg ctgtttggtc taaanaagtc tggatngggt ataaatgaca     300
cnaanctatc atgactnt                                                   318
```

<210> 445
<211> 418
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(418)
<223> n = A,T,C or G

<400> 445

```
ccagtccaac ctgctcctca ttattgtata aatgagcaga atcaatatgg cggaagccag      60
cttcaattgc caatttggtg gcctctaaag ctttactttt aggaacctct gcaggcgcat     120
aggtgccaaa tcccaggaca ggcatgaagt gaccatcatt cagcttcaca cactgatatt     180
tcgaatccat ttctgtcact agcctggctg gcaaatgttt ctttcttcct ccctcacagg     240
ctataagagc aatgagctgg caacgcccct gagcacactg tctgctgntt aaccaatggc     300
atgtgagagg agggacagag gcagtcttac acaagctgtg ataaaaattg catncagttc     360
aaccagtttc ttacnttatt ctaatgngna ggaagtgtgn gaagagcaca aagtcaga       418
```

<210> 446
<211> 361
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(361)
<223> n = A,T,C or G

<400> 446
ctgtccaatn acaacaggac cctcactcta ctcagtgtca caaggaatga tgtaggaccc 60
tatgagtgtg gaatccanaa cgaattaant gttgaccaca gcgacccagt catcctgaat 120
gtcctctatg gcccagacga ccccaccntt tccccctcat acacctatta ccgtccaggg 180
gtgaacctca gcntctcctg ncatgcagcc tctaacccac ctgcacagta tccttggctg 240
attgatggga acntccagna acacnacaca agagctcttt atctccancn tnactganaa 300
gaacagcgcg actctatncc ttccaggggg gggggtggg gnntgnggac cttnccgggc 360
c 361

<210> 447
<211> 321
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(321)
<223> n = A,T,C or G

<400> 447
ccagganant ggttccccaa aggggacctc acccgccccg agctctggag ccgctgacgc 60
tcgcatccag gacatttgag atgggaatcc aaataggcta cttgnaaaag acgtgctgca 120
ngcagccctg gagagactca tggagttcat tgtacattac tccatctacc gaggcagcgc 180
atggcatgac tnaacggctt gnaacaaaca canaaattac caccacaaac attcaggaac 240
caaatataat ctgccatggt cacaccacag acaatgcagg aagaggcttt ttattgctng 300
ngtgngtttt caaatcatgt t 321

<210> 448
<211> 325
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(325)
<223> n = A,T,C or G

<400> 448
ccagcttcaa ctttttagta tagaagatac aggatcacaa aaaggagact acgctttgca 60
aacatagcat caaaattcaa cttttctctt tgcagtttat ccatggngtc agcatacctt 120
gcaagggaag ctacttacat caaataactt ttctatatac atttcctcat tgacctttc 180
tcaaagaata tcttggtttt gccgaacaaa cataatatag gngtctgcca gatccattcc 240
tggtttctgt ngtgaaggaa aagcaggggg aacaaaataa tatcagggtc tcaatngtga 300
nattattatt taatcatacc ctgan 325

<210> 449
<211> 123
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(123)
<223> n = A,T,C or G

<400> 449
cattaatntt ggaagcgatg gtgtggatta catcagtgtt agggcatggt gtggatatta 60
ttacattann attggaagcg atggtgtgga ttacatcagt gatagggcac ggtgtggata 120
tta 123

<210> 450
<211> 328
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(328)
<223> n = A,T,C or G

<400> 450
ctggcaattt tgagctgccg gttatacacc aaaatgttct gttcagtacc tagctctgct 60
cttttatatt gctttaaatt tttaaagaaa ttatattgca tggatgtggt tatttgtgca 120
tattttttaa caatgcccaa tctgtatgaa taatgtaaac ttcgattttt ttttaaaaaa 180
attagatttt agctggagct tttgactaat gtaaagtaaa tgccaaacta ccgacttgat 240
ngggatgttt ttgtaangtt aattttctaa gactttttca catccaaagt gatgctttgc 300
tttgggtttt aactgtttca acntnggn 328

<210> 451
<211> 209
<212> DNA
<213> Homo sapien

<400> 451
ctgccttgtt tcaacagaca tgcaaagatc ctaggagaca gtccccatag accttcagac 60
attaaaaagg gagccgtaca gtttgtttga agcacttcgt cttacccatt tatgcagggg 120
ccccaggaaa cttacacaca gccagaatga ggttcccaaa ggacttacat taattatggc 180
tcttgcttcc tttcacaaat gagctgagg 209

<210> 452
<211> 457
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(457)
<223> n = A,T,C or G

<400> 452
ctgtctantc ccttcaagag ctgtttatag aagcttgaga atggggtaaa aatttctgct 60
agcaaaatca agttcttttt gaaattttat cagtaatcca gaatttagta gtccatgcct 120
tctcactcag catttagaaa taaaaatgtg gtttcttaaa cgtatatcct ttcatgtata 180
tttccacatt tttgtgcttg gatataagat gtatttcttg tagtgaagtt gttttgtaat 240
ctactttgta tacattctaa ttatattatt tttctatgta ttttaaatgn atatggctgt 300
ttaatctttg aagcatttg ggcttaagat tgccagcacc acacatcaga tgcagtcatt 360
gttgctatca gtgtggaatc tgatagagtc tngactccgg ccacttggag ttgtgnactc 420
caaagctaag gacagtgatg aggaagatgg catgtgg 457

<210> 453

<211> 277
<212> DNA
<213> Homo sapien

<400> 453
ccaattgatt tgatggtaag ggagggatcg ttgacctcgt ctgttatgta aaggatgcgt 60
agggatggga gggcgatgag gactaggatg atggcgggca ggatagttca gacggtttct 120
atttcctgag cgtctgagat gttagtatta gttagttttg ttgtgagtgt taggaaaagg 180
gcatacagga ctaggaagca gataaggaaa atgactacga gggcgtgatc atgaaaggtg 240
ataagctctt ctatgatagg ggaagtagcg tcttgta 277

<210> 454
<211> 198
<212> DNA
<213> Homo sapien

<400> 454
gttaaaagat agtaggggga tgatgctaat aatcaggctg tgggtggttg tgttgattca 60
aattatgtgt tttttggaga gtcatgtcag tggtagtaat ataattgttg ggacgattag 120
ttttagcatt ggagtaggtt taggttatgt acgtagtcta ggccatatgt gttggagatt 180
gagactagta gggctagg 198

<210> 455
<211> 608
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(608)
<223> n = A,T,C or G

<400> 455
ctgagcaagc taaggaccag gggcaactag accctaataa tgngtacttt tgaaaatgat 60
acaaactacc ttggttgtaa gaagtgcagg ttgaacactt taggagaaca gtcttcaaac 120
tggcaattca aaatttccca ttatatgtga ataaaattgg aaggatgtta aatgtccatg 180
gaaagttact cttgtaagtt aggatgcctt atactgaggc tttanaatga aagtacactt 240
cacaaatgga atagtgaaca taaattacca gaagtcaaga taatagtcat actagtaagg 300
taagcaaggt aaattccctt atacacaaaa attattttga tgaccttttt caataatgaa 360
tctgaaatga agtgttttaa aaagctccct aaacacaaaa cgaacataaa actgcttaat 420
aactttagag ctcatgtaat attcttgctg aaaacagtta ctgaaattac cagcgaaatg 480
atggaatatc tttaaagcag gncactcngt ataatctgga ataatttcat ttgctaactt 540
ttaagaagta ttctctggac tataaatcnt gggcaaatag acttccactt tattattacc 600
ccaaatta 608

<210> 456
<211> 467
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(467)
<223> n = A,T,C or G

<400> 456
cctggacctg tgtaaacctt caaacactct tttttacatt aggtcgtgaa gttaaatttt 60
ttactgtttc tgtgctacag actcttcaaa gggaaatagt taagtcaatt tcaaagaaaa 120
tgaccagcac atttttaaaa cattagaaat gatttgactt tgactatcta ctgccaaaaa 180
aaggttaagg aatttgtaat gagaagctaa aaactttaag gaattttaag gaactcaaaa 240
caaaaactca ttaaatgtaa ttaaagtgaa ttctacaaat [illegible] [illegible] 300
tataatagtc acttaagact taaattcaaa cactagcaaa ccacaaaatc agactgtntg 360
actgacatcc aaaagataaa tataaatcaa aatccgaccc cagcattagc caaggggtag 420
gtgttcctct tgaggaaggc aggaattcct cttctgccac ctgttgg 467

<210> 457
<211> 183
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(183)
<223> n = A,T,C or G

<400> 457
ccaaattttn tactttaaac actgaaaaca gaggaagtta ataaaaattt taacctataa 60
agtcccctgg ttgttagtca ttaacagcag attgtcagat aagactggta aaatgatggc 120
tgctaagcat ttgatgatcc aggcgcagga tgatcaaact gcagcagatc atgcacgtga 180
cag 183

<210> 458
<211> 445
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(445)
<223> n = A,T,C or G

<400> 458
gaaaaatata aagccaaaaa ttggataaaa tagcactgaa aaaatgagga aattattggt 60
aaccaattta ttttaaaagc ccatcaattt aatttctggt ggtgcagaag ttagaaggta 120
aagcttgaga agatgagggt gtttacgtag accagaacca atttagaaga atacttgaag 180
ctagaagggg aagttggtta aaaatcacat caaaaagcta ctaaaaggac tggtgtaatt 240
taaaaaaaac taaggcagaa ggtttttgga agagttagaa gaatttggaa ggccttaaat 300
atagtagctt agtttgaaaa atgngaagga ctttcgtaac ggaagtaatt caagatcaag 360
agtaattacc ancttaatgt ttttggcntt ggactntgag ttaagattat tttttaaatc 420
ctgaggacta ncattaatgg gacag 445

<210> 459
<211> 426
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(426)
<223> n = A,T,C or G

<400> 459
cctatgatan cttctctagc tatcatactc caatcagcaa aaaatgagaa aatgttgaga 60
aatagaagat aattcctcat ttaaggccac cttctagaat ttgtgcttaa gattctgctt 120
tcttctcatg ggccagcact tcggcaactg gcaaaaatta ggtgtacagg gatctaggta 180
atactgttta tttgagcaat aatatattgt gctaacgttc aggcatccta ttactgagaa 240
ataagggaaa atgagtgtaa agtacaacta agagtctcgg cgacagggaa aaataccatc 300
agttaaatat ccatagtcct agagcattta tgtaaaactg caatntgaat cctgcaatac 360
atnttggctt tttccctcag tgataccatg tgagggaagn ngctctgtca aggcgggccg 420
gataga 426

<210> 460
<211> 348
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(348)
<223> n = A,T,C or G

<400> 460
ccaaatttta aaatgttatt tttcatatca tttataacct tgtcacaatc cacttaaaga 60
agtttggtta tatttcactg aaaattttct tccagagtag gtttttttc gtgggttggg 120
gggtaacttt actacaatta gtaagtntgg tgcagaattt catgcaaatg aggagtgcag 180
cagngtgata atttaaacat atntaaacaa aaacaaaaaa aatgaatgca caaacttgct 240
gctgcttaga tcactgcagc ttctaggacc cggtttcttt tactgatnta aaancaaaac 300
aaaaaaanta annacnttgt gcctgaaatg aancttgttt ttttntna 348

<210> 461
<211> 378
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(378)
<223> n = A,T,C or G

<400> 461
ccactaagac agaacggaat ctagtagaag tgcaccaatg cttcagtccc tcctactcag 60
catggtgagc agtggtcaat ctgtgccctg tggaatgatg ggcagataat tctggcatgt 120
gtaaataata ataaataatt cacttggtgc aggcagtatg tctatgaatt aaaacctagt 180
gtgtacacag tgcctacatg tgttacagcc ccacagtagg aatctacacc aaaatattta 240
ttagaaggaa tttggtccgt actacatcac gctttccgga gggtaaaaaa taaagtccat 300
ctatagacat ttcaccacag acccagagac tgagtctggc taaaacctgc aaaatgtcta 360
taacaaaagn ggatggct 378

<210> 462
<211> 197
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature

<222> (1)...(197)
<223> n = A,T,C or G

<400> 462
gcgaggtcca cactattaaa agctgttggg taattgaagg tgatataaaa tgactgtcnt 60
catttggagt gngcagcaca nttacttcat [illegible] [illegible] [illegible] 120
aagttctcac acagatnggn agaaatcata cctanttntg gtnaatcact atggcagccg 180
tngaagaatn taagaga 197

<210> 463
<211> 279
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(279)
<223> n = A,T,C or G

<400> 463
cataagtgat gangaggnaa aatcantnaa taagcctaca acntagaata cattaaaact 60
tgcacatata catgttcaca gcatgtatac aatgataatc cctacggttt aaccaagtta 120
tggttccctt ctacagcaga cacaaaacca aggtgaacta ggtnggcaga tgtanaggga 180
ataccaaaaa aagggtaatn ngntcactga ttctgaagna tntgactgan catactgagc 240
ttctgnactt tgggaatgca tnnaggnaac aatatcttg 279

<210> 464
<211> 552
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(552)
<223> n = A,T,C or G

<400> 464
gatgggttga taggtgcagc aaaccacccct ggcgcatgtt taccaatgta acaaacctgc 60
acatcctgca caggtactcc aaaactaaaa gtaaaaaaat ctaaaagaaa aaagaaaaag 120
aattaaaccc aaaatcactt ccccatctgg acttgattta gatgaaaagc ttctggactt 180
tgagctgatg ctatagtggg ttgaaaattt tggggtcctc agaaggggat gaggatatat 240
tgcatgagag agcaacatga atcatngaga gccagagtat agagagnggt gggtagactg 300
taggagagcc ctcaatgatc ccggctgtct tgtattcgcg ttgcacttac ttgtataata 360
tggcagatgg gatgtgatgt cactttcaag attangttat aaatagacta tggcttcaat 420
cagagggttt tcttctctgt ctanctctct tttgggtagn ttcattctga gagaaagcca 480
nacctcngcc gcnacccacg ctaaggggcg anttccagcn cactggcggc cngttactag 540
tggatccgng ct 552

<210> 465
<211> 444
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature

<222> (1)...(444)
<223> n = A,T,C or G

<400> 465
ccactcttgg tagaaacctt gaaactttca ccttgctggg ctttagcaaa gtttcctttt 60
acagttctgt ttatgagctt cagctactga taaagcactt cctgaacttc tctattatca 120
tagngaccct ctgaataacc tgagtgactg gctcggcaat tcgctttata accattctta 180
ttcccaaagt tggagcacat aaacatttag atgtcttttc ctgtaaaata ttctagacat 240
ttacccaaac tctagttcaa catatactca acttgcactg tatatctccc tgcttttttg 300
agacagagaa gaaattcagg aggtgnccca tctccagagt ttctctgttg gaaagcagcn 360
atcaagaanc ctttaaaaaa ttggtgtnaa gctntgccnc ctgcagaaat gcntngcccc 420
acattattct tctggggnaa agna 444

<210> 466
<211> 381
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(381)
<223> n = A,T,C or G

<400> 466
cctactatgg gtgttaattt tttactctct ctacaaggtt ttttcctagt gtccaaagag 60
ctgttcctct ttggactaac agttaaattt acaaggggat ttagagggtt ctgtgggcaa 120
atttaaagtt gaactaagat tctatcttgg acaaccagct atcaccaggc tcggtaggtt 180
tgtcgcctct acctataaat cttcccacta ttttgctaca tagacgggtg tgctctttta 240
gctgttctta ggtagctcgt ctggnttcgg gggtcttagc tttggctctc cttgcaaagt 300
tatttctagt taattcatta tgcannaggt ataggggnta gtccttgcta tattatgctt 360
ggttataatt tttcatcttt c 381

<210> 467
<211> 95
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(95)
<223> n = A,T,C or G

<400> 467
cctatanatt ntggnttgta tactgggtcc tgaaaaccct cttggngctc tgtttttaag 60
gagctgaanc caangancgc caataataat acttt 95

<210> 468
<211> 224
<212> DNA
<213> Homo sapien

<400> 468
cagtgggtct ctgatgcctt gcctgcagca gaaggaggga gcagagatca agaggaagga 60
aaaaatcata tgtacttatt tgaaggtaaa gattattcta aagagcccag taaggaagac 120
agaaaatcat ttgaacaact ggtaaacctt cagaaaaccc ttttggagaa agctagtcaa 180

gagggccgat cactccgaaa taaaggcagt gttctcatcc cagg 224

<210> 469
<211> 416
<212> DNA
<213> Homo sapien

<400> 469
ctgagttcta gttcaaaagc tttatcctta acttcgtcat gtactatgta aattctagaa 60
tagaaaaggg aaaggtaaga ttttggtaac ctccaaacat tgaagtagtt cacagaccca 120
aagtcagtac aaattagaat gtccatccat aataaaagta tctataaaat tacacagaca 180
cattctacat agtatttaac attagagaag acaaattaca cagggactga aataaaatga 240
aacatctact ctcccgacaa atgttgaata tacctaatca acccaagttc agtttatttt 300
tgcacattgc tttagagata taacttggct gggcacagtg gctcacacct gtaatcccaa 360
cactttggga gaccaaggcg gatggatcac ttgaggtcag ttcgagacta gcctgg 416

<210> 470
<211> 376
<212> DNA
<213> Homo sapien

<400> 470
cacctttttaa ctgtatcaca aagtctgttg ctgtggttac agcctttgtt tccagtgatg 60
ttttgtccat gctttccccc aaccccttaac aatggttact caaaagaatg aaataatgag 120
tcattcattc gggaatatgt taaaatatcc ctctttatca ttacatttca ctgcttagaa 180
actaggctgt aattcaaggc aacagttaag tctgagaact gttaaaaaaa tctttgattt 240
tttttcattt ttaagaaaaa cctgcctatt taattgttca gacttgtaag aggttcttca 300
attacatcct ttttggttaa tgtattattt ctggaacaag tagataaaat tctacgcagt 360
aagcataata aaaatc 376

<210> 471
<211> 357
<212> DNA
<213> Homo sapien

<400> 471
ggcttcgtat aatggttctt ttgtcacccc tgatcgacga tttcgctacc cgtacaactc 60
tgacaaggga acgaaatgct tctgtgtatt cacctagtgg tcctgtgaac agaagaacaa 120
caactccacc ggatagtgga gtactgtttg aagggttagg catttcaaca agacctagag 180
atgttgaaat tcctcagttt atgagacaga ttgcagtaag gaggccaact acggcagatg 240
aaagatcttt gcggaaaatt caagaacaag atattattaa ttttagacga actctttacc 300
gtgctggtgc tcgagttaga aatattgaag atggtggccg ctacagggat atttcag 357

<210> 472
<211> 557
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(557)
<223> n = A,T,C or G

<400> 472
cngagatgac atttacaatc tcttgaaang cagcagatgg cactctggtg cttcctatga 60

agcaacatgc ttgaaatcaa gggccaacaa ttgttgtagg aaagcaaaat atacctctaa 120
cacctacgtt taccaaaaaa gctgacatct caaactctga gttgttgaga ctcaaatttc 180
tcatccccaa agaagcctat tacggtagtg tgntggatgc tttttgtatc tctgataggc 240
aggcactata atggggggaa atacttctga ataaaaacat tggctgtctt gcaactgtgc 300
atataatgtc tattcaaggg ggcagtgtgc ctagcatgat cctgaaatgt tgagataaaa 360
ggaagttggc attaaagcac tatttgtctt atatgaaaag agtgactcta tcttccagta 420
aacaagantt cctgcaatga aaaagaaatt ttttccttca ttatctataa actatacaaa 480
ataaccttcc tttttaacct aagactcaaa cattnatatt tgattttatt ctatttgata 540
ccaattggta tgtccag 557

<210> 473
<211> 264
<212> DNA
<213> Homo sapien

<400> 473
cctccatcaa cagaaaggat aaagacccct tcgggtctcc tcattaattc tgaactggaa 60
aagccccaga aagtccggaa agacaaggaa ggaacacctc cacttacaaa agaagataag 120
acagttgtca gacaaagccc tcgaaggatt aagccagtta ggattattcc ttcttcaaaa 180
aggacagatg caaccattgc taagcaactc ttacagaggg caaaaaaggg ggctcaaaag 240
aaaattgaaa aagaagcagc tcag 264

<210> 474
<211> 165
<212> DNA
<213> Homo sapien

<400> 474
aattcagctt ccagaggccc ttattagtcc ttgttgacag aaacatagat ttggcaactc 60
ctttacatca tacttggaca tatcaagcat tggtgcacga tgtactggat ttccatttaa 120
acagggttaa tttggaagaa tcttcaggag tggaaaactc tccag 165

<210> 475
<211> 417
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(417)
<223> n = A,T,C or G

<400> 475
aagttctctt cttgttttaa acacattcct gataacttct aaagatgacc aaaataaaac 60
agaatatcta cagagatcat tttctgaatt ttttgtacat ccaaggataa caacataaaa 120
aaaataaaac tggacagcat tccacatcca agtgcacaga accatttttg caagattaaa 180
taatgtaaac attgggaaca gccaaatcag cgaagaatgc caacacctca aaacacctgg 240
tgttgccgct tcattaagtg gttcaaaatc cagatctata attgcgcaat attcaccgta 300
tataaaaaga aatggatatt aatttgaca aatagctgca actgagactt ctttttattt 360
ctttatatgn gnatatagtg aatttttatt atttttaaaa ttttatttat tttttta 417

<210> 476
<211> 321
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(321)
<223> n = A,T,C or G

<400> 476
catttaataa caaaaacaac ctgtacggaa aacccnaagg caaccacata gcatatgtaa 60
aatgtgcaaa tacactttaa aatgcangtt attctatagc anttgcaaga tagaatttca 120
ctgtaattag ggaatctagc tcatcctaac ttaatagnct tttgcatgtn tagacaatgc 180
aattctacaa ggnacnactc agcgttgatg ctaaagtatg aaacacatcc tcagattatt 240
catccgaaaa tattaaaata gcntcatgtt ttattattct ttaatgagtc ntgagctcat 300
ttctaaagct tcataaagca t 321

<210> 477
<211> 546
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(546)
<223> n = A,T,C or G

<400> 477
gctgtggtta tattgtaaat gaagcatcta acatgtgcac aacttgcaac aaaaactcct 60
tggactttaa atctgtcttt ctcagtttcc atgtgctgat tgatctgact gatcacacag 120
gcacccttca ttcctgtagt ctcacaggaa gtgttgctga ggagactttg ggctgcacgg 180
tacatgagtt tcttgcaatg acaaatgaac agaaaacagc attaaagtgg caattcctct 240
tggaaagaag caaaatttat ttaaaattcg ttctatcaca cagagcaagg agtggattga 300
aaattagtgt actctcgtgc aagcttgcag atcctactga ggcaagcaga aacttgtctg 360
gacaaagaca tgtttaaaac ggtctatcat tttgaactct ggaaaagtat aagagtttta 420
actcccttta aaatggaata ttaatttgaa aattatgggg aaaattgcat tttgtttaca 480
tgtggtgaac atgtttctag aaattggtat ggcgggaagg gggctgggtg agtctgaagg 540
acctcn 546

<210> 478
<211> 100
<212> DNA
<213> Homo sapien

<400> 478
aagaaaagtg gtaaaatcaa gtcttcttac aagagggagt gtataaacct tggttgtgat 60
gttgactttg attttgctgg acctgcaatc catggttcag 100

<210> 479
<211> 508
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(508)
<223> n = A,T,C or G

<400> 479
gnnttccaaa ttcttctaac tcttccaaaa gccttctgcc ttagtttttt ttaaattaca 60
ccagtccttt tagtagcttt ttgatgtgat ttttaaccaa cttccccttc tagcttcaag 120
tattcttcta aattggtcct ggtctacgta aacaccctca tcttctcaag ctttaccttc 180
taacttctgc accaccagaa attaaattga tgggctttta aaataaattg gttaccaata 240
atttcctcat tttttcagtg ctattttatc caatttttgg ctttatattt ttctatcttc 300
tatacttctc caatacttgt cttagcttgt ttttcatttt ctatctgaaa ctcttgacaa 360
tatcttctaa tttccctatc ttctctattc ttttcttcgc cttcccgtac ttctgcttcc 420
agntttccac ttcaaacttc tatcttctcc aaattgttca tcctaccact cccaataatc 480
tttccatttt cgtgtagcac ctggncag 508

<210> 480
<211> 81
<212> DNA
<213> Homo sapien

<400> 480
ggtgcccttt tcctaacact cacaacaaaa ctaactaata ctaacatctc agacgctcag 60
gaaatagata aggaaaatga c 81

<210> 481
<211> 306
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(306)
<223> n = A,T,C or G

<400> 481
tcgccttcgg ccgccgggca ggttaggggn acaagacgct acttccccta tcatagaaga 60
gcttatcacc tttcatgatc acgccctcat agtcattttc cttatctgct tcctagtcct 120
gtatgccctt ttcctaacac tcacaacaaa actaactaat actaacatct cagacgctca 180
gggaatagaa accgtctgaa ctatcctgcc cgccatcatc ctagtcctca tcgccctccc 240
atccctacgc atcctttaca taacagacga ggtcaacgat ccctccctta ccatcaaatc 300
aattgg 306

<210> 482
<211> 582
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(582)
<223> n = A,T,C or G

<400> 482
ggggggaaca gtcattatac attatttaga ctcattcctt cttccagtgc ccttatgatt 60
atttcctacc tttaccattg atcttaaact gngcaggcta aaaagaggaa ccagaactcc 120
cttaagcact tttaagacta tttaaaaaat aaagntttgt tggcattgaa gagtaagctg 180
cttaagggac tgaatgaaaa gatagtaccc tttgtggctg tatgaagaga gaaactgaat 240
ttctatccaa gagaccttaa tntagcctat tagggaatta tcttccccaa aagtacaagt 300
aattttgcac tgcaggagaa ggataagtag atttgattta catcacattt tatacacacc 360

tttcaagang gagaaatctg cttcataaat agnaggaatc tatgcttaaa ctnaacattt 420
aatggtgacn tcttacaaca gccttgaaaa nnattggaan tcngacntga nggnggaaac 480
tggaanaaag aatatctttc tcttctgcat cctttnatcc tcaaacttag catggattca 540
cacgctgagg aaangttngg tnacnaccng aacatttaga ta 582

<210> 483
<211> 275
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(275)
<223> n = A,T,C or G

<400> 483
gcctcactaa aataacagat ttcagtatag ccaagttcat cagaaagacc caaatggaat 60
gatttacaaa atagaacact ttaaaccagg tcagtcctat ctttttgtag ctgaaggcta 120
tcagtcataa cacaatttcg cgtacacctc tgctcattat ggaattacac ttaaaacgaa 180
tctcaagagg gtgaccattg ttgtttcaga taccatccct aaggagagtg gttaacagga 240
agattgccag ngttactgat ggaaagaagc gcttg 275

<210> 484
<211> 434
<212> DNA
<213> Homo sapien

<400> 484
catatttcca caggccaatt tctttctgtt tttctgctaa gctatttcag cattttagct 60
tttcctcttt gctttgttta ctcatgattg ccagatggct acgttacctc taagcatcag 120
atcctcacaa attaatggtt aaatgtaagg gagggatttt actctcttgc attaaaaaaa 180
agctttattg agatataatt tactgtaaca ttgactcatt taaagtatgc tagtcaatag 240
accaaatctt gaataaactc ccattcacaa ttgctacaaa gggaataaaa tagctgggaa 300
tatagctaac aagggaagtg aagggcctct tcaaggagaa ctacaaacca ctgctcaaga 360
aataagagag gatacaaaca aatggaaaaa cattccatgc tcatgaatag gaagaatcaa 420
tatcgtgaaa atgg 434

<210> 485
<211> 291
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(291)
<223> n = A,T,C or G

<400> 485
ncaccactgc agccctacat acagttgaaa aaaaattcca ttctgttaac atttgtttta 60
taagttttca cgcaatacac aaaaaacccc tctgcacttc ttgtaaagaa caaaaaagat 120
acacaacagt taagcgtaaa gatcacaggc aatagcattc aaacatggat gtgggtagag 180
aaaggagtac ctggcatgag tacctgctta gtttgactga atccttgatt tttaatttgg 240
cttttcatgg gccgctcaca acaccaacgc tgtgtgaggt atggtagtca g 291

<210> 486

<211> 274
<212> DNA
<213> Homo sapien

<400> 486
ctgtaatatt gtagttgctc cagaatgtca agggcagctt acggagatgt cactggagca 60
gcacgctcag agacagtgaa ctagcatttg aatacacaag tccaagtcta ctgtgttgct 120
aggggtgcag aacccgtttc tttgtatgag agaggtcaaa gggttggttt cctgggagaa 180
attagttttg cattaaagta ggagtagtgc atgttttctt ctgttatccc cctgattgtt 240
ctgtaactag ttgctctcat tttaatttca ctgg 274

<210> 487
<211> 184
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(184)
<223> n = A,T,C or G

<400> 487
tggcaccaag attctcagct cacggtacca gcatctgatt gtcggactac ctgctgcttt 60
ccctgatatt tatacatgat attcgnaaaa tgtaaagaag ctattattca tacagacatc 120
tagagaagga gngaagnttt taaaaaaata aaaaaatact tatttcaagc tttagctgtg 180
ttct 184

<210> 488
<211> 393
<212> DNA
<213> Homo sapien

<400> 488
ctgcattttt attgcgatct gcagatgaac tggaaaatct cattttacaa cagaactggg 60
acagacgacc accatattca ctgaggtcta aatttgcagt ttccactaat gacattttga 120
tttcccaaca gagatacttc tggtcttact gcacagtctt ttaagagaaa tacttccatt 180
atgccacatt gtccttgatc cgtaagtgat gtgttaaggt gcttcaaagg aactctgacc 240
tctgaagtac ttgagctact ttagtatgtc cagcctattg ctttttgttt tagtgtgtca 300
ccataaatat caggggcata aaaggctatc tattcttaat tcaaggataa aacagaagaa 360
gcttgtggta taaaacaata gttcaagatc cag 393

<210> 489
<211> 607
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(607)
<223> n = A,T,C or G

<400> 489
gtgcttatgt acttaagggg aactactcta actgggtgaa gagtangatg aagcatccat 60
gtccctacaa aggatatgaa ctcatccttt tttatggctg catagtattc catggtgtat 120
atatgccaca ttttcttaat ccagtctatc atcgatggat atttgggttg gttccaagtc 180

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tttgctattg tgaatagtgt cgcaatgaac atacatgtgc atgtgtcttt atagcagcat      240
gatttataat cctttgggta tatacccagn aatgggatag ctgggtcaaa tggtatttct      300
agttctagat ccttgtggaa ttgccacact gtcttccaca atggttgaac tagtttacag      360
tcccaccaac agtgtaaaag tggtcctatt tctccacatc atctccagca cctgttggtt      420
cctgactttt taatgattgn cattccaact ggtgtgagat ggtatatcac cgtgggtttg      480
atttgcattt ccctgatggc cagtgatgat gaacnttttt [illegible] [illegible]      540
taaatggcct gcctttnta cttctataaa atttttcann tcttattatt attcctgggg      600
gnttaag                                                                 607

<210> 490
<211> 179
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(179)
<223> n = A,T,C or G

<400> 490
cttctaggaa tactagtata tcgctcacac ctcatatcct ccctactatg cctagaagga       60
ataatactat cactgntcat tatagctact cccataaccc tnaacaccca ctccctctta      120
gccaatattg ngcctattgc catactagtc tttgccgcct gcgaagcanc ggtaggacc       179

<210> 491
<211> 399
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(399)
<223> n = A,T,C or G

<400> 491
cctctacctg taatcacatt aatttttcta aagacagggg nggtgttttg aagataaatg       60
tcattagtct atgataatag catcatagga caattagcca ttttagactt gaccatattt      120
tctcttttta gcatatagcc atcttgatat ttaggnggga gactactcca atggagcaac      180
agtttcattt tacatgattg gatttagaaa tttacaaatt ttaaactcat aagaattcta      240
aataatttga aaatggaaac atttgaccca cagtctagca gcataaatac atttataaaa      300
tacttcattg ttgatcttag gtcattgatt taaaacagaa tttggtgact atgggcaggt      360
ggagggggcc ngtgaggaag gtataaaaga gaaatcttt                             399

<210> 492
<211> 482
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(482)
<223> n = A,T,C or G

<400> 492
ctccacctta ctaccagaca gccttagcca aaccatttnc ccaaataaag tataggcgat       60
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agaaattgaa acctggcgca atagatatag taccgcaagg gaaagatgaa aaattataac 120
caagcataat atagcaagga ctaaccccta taccttctgc ataatgaatt aactagaaat 180
aactttgcaa ggggagccaa agctaagacc cccgaaacca gacgagctac ctaagaacag 240
ctaaaagagc acacccgtct atgtagcaaa atagtgggaa gatttatagg tagaggcgac 300
aaacctaccg agcctggtga tagctggttg tccaagatag aatcttagtt caactttaaa 360
tttgcccaca gaaccctcta aatccccttg taaatttaac tgttagtcca aagaggaaca 420
gctctttgga cactaggaaa aaaccttgta gagagagtaa aaaatttaac acccatagta 480
gg 482

<210> 493
<211> 207
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(207)
<223> n = A,T,C or G

<400> 493
cataaatatt atactagcat ttaccatctc acttngngga atgctagtat atcgctcaca 60
cctcatatcc tccctactat gcctagaagg aataatacta tcactgttca ttatagctac 120
tctcataacc ctcaacaccc actccctctt agccaatatt gtgcctattg ccatactagt 180
ctttgccgcc tgcgaagcag cggtagg 207

<210> 494
<211> 283
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(283)
<223> n = A,T,C or G

<400> 494
ccaattgatt tgatggtaag ggagggatcg ttgacctngt ctgttatgta aaggatgcgt 60
agggatggga gggcgatgag gactaggatg atggcgggca ggatagttca gacggtttct 120
atttcctgag cgtctgagat gttagtatta gttagttttg ttgtgagtgt taggaaaagg 180
gcatacagga ctaggaagca gataaggaaa atgactatga gggcgtgatc atgaaaggtg 240
ataagctctt ctatgatagg ggaagtagcg tcttgtagac cta 283

<210> 495
<211> 590
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(590)
<223> n = A,T,C or G

<400> 495
tatgtatata atttcttag ttactagcat agagaaatta ctgatttaaa aaaacatttc 60
aaattctagc atgttgtagg attctattgc cctttctaaa aagtacatct tgcttatccg 120

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atttctaaca aaactattta atttgaagaa gggagaatga atttggataa aaagcaaaaa      180
tttaaaggta ctcaaattta ggcaaaccat taaagcaatc ttagtttaca gttaattggg      240
tagaatggtc aacactttct tcaggttagt tcatggagtg gatatgcatt gatagaacaa      300
cttagagatg cttttacagt tgagaaagct cattatattt gttatcttta agaatcagct      360
tatttatttc atatgtttgt tctttaagaa gaccaaagag ccctgcaaat gaatgttgat      420
ttgttttttt gtttgtttaa [illegible] gagataagat ctcactttgt tatgttgccc      480
aggctggtct caaactctca acttgaagtg atctgcccac ctcagcctcc caaagtggtg      540
ggattacagg catgagccac cgcacctgga cctgcccggg cggncgctcg                 590
```

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<210> 496
<211> 307
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(307)
<223> n = A,T,C or G

<400> 496
ggagattagt atagagaggn anacnttttt tcgngatatt tggtcacatg gataagtggc       60
gctggcttgc catgattgtg aggggtagga gccaggtagt tagtattagg aggggggnng      120
ttagggggtc tgaggagaag gttggggaac agctnaatag gttgttngnt gatttggnta      180
aaaaacanta gggggatgat nctaataatt antgctgtgg gtggttgtgn tgattcaaat      240
tatgngcttt ttcggagann catgtcangt ggtagtaaat ataattgttg ggaccattan      300
ttcttan                                                                307

<210> 497
<211> 216
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(216)
<223> n = A,T,C or G

<400> 497
cattttcctc ttggtttctt cagttaagtc aaanngncac gttcctcttt ccccatatat       60
tcatatattt ttgctcgtta gtgtatttct tgagctgttt tcatgttgtt tatttcctgt      120
ctgngaaatg gtgttttttt ttgttgttgn tggttttttt tttttttttt aaactnggna      180
ccncnaantt gaaaaaatgn ttntttttcc ctnaca                                216

<210> 498
<211> 375
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(375)
<223> n = A,T,C or G

<400> 498
gaatttcctg gcaccttttc tcgctagaga agattnngtg tgactgggtt gcctataagc       60
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catatagata caaactttta tctctaatac caagtcttag agggatatat taatagatct 120
aataaattta ttcttagact tattgtttca tgggntagtg agtctttgct actggagaca 180
atacagactt gtcagttttt ttaaaaaaaa aaaatttgcc aagctancac attaaaaana 240
tntcctaagg ctntcatttt atgaggatga ttataaacnt ttntgngata aatatcacca 300
taataaactg ttaagtacaa ctgcnggccn cccttanagn gaattcctnc agttanaaat 360
ttattttttt gccaa 375

<210> 499
<211> 215
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(215)
<223> n = A,T,C or G

<400> 499
ccacnaaagc agaagcttaa agcatagtag taaagaggnn aaaaagaagg acgaaaataa 60
atcagatgac aaggatggta aagaagttga cagtagtcat gaaaaggcca gaggtaatag 120
ttcactcatg gaaaagaaat taagtagaag gttgtgcgaa aatcggagag gaagcttgtc 180
acaaaaaaaa aaaaaaaaaa aaaaaaaaat gtttt 215

<210> 500
<211> 489
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(489)
<223> n = A,T,C or G

<400> 500
ccactacgat aagcaggtag ctgggttttg tagtgagntt gctcccttaag ttacaggaac 60
tctccttata atagacactt cattttccta gtccatccct catgaaaaat gactgaccac 120
tgctgggcag caggagggat gatgaccaac taattcccaa accccagtct cattggtacc 180
agccttgggg aaccacctac acttgagcca caattggttt tgaagtgcat ttacaaggnt 240
tgtctacttt cagttcttta ctttttacat gctgacacat acatacactg cctaaataga 300
tctctttcag aaacaatcct cagataacgc atagcaaaat ggagatggag acatgatttc 360
tcatgcaaca gcttctctaa ttataccttta gaaatgttct cctttttatc atcaaatctg 420
ctcaagaagg gcttttttata gtagaataat atcagtggat gaaaacagct taacatttta 480
ccatgctta 489

<210> 501
<211> 286
<212> DNA
<213> Homo sapien

<400> 501
aaaaacactc aaacacagcc ttggagggag gagtcagttt taaaagactc ttataaaagt 60
aatatactgc tagctctgaa gaatcggagg ctaaaatcat ctcttcaagt ccccagggaa 120
tcccaaagaa ctccaggggga aggtgggatg ggccagagag ctctggaagc ttccaggtct 180
gttgcaagcc tcacctggta cacagtaggc tcttccaggt ctgtcaggaa cccaggagcc 240
tcccctagca cacagtaggc tcacaaaaag ggagcactgc tgctgg 286

<210> 502
<211> 168
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(168)
<223> n = A,T,C or G

<400> 502
cctatgattg tgggggcaat gaatgaagcg aacagagntt cgttcatttt ggttctcaga 60
gtttgttata attttttatt tttatgggct ttggtgaggg aggtaagtgg tagtttgtgt 120
ttaatatttt tagttgggtg atgaggaata gtgtaaggag tatggggg 168

<210> 503
<211> 173
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(173)
<223> n = A,T,C or G

<400> 503
cctttataat aaattaggca aaaggttcag tgcnnggcta tantggacaa catgaaactc 60
cataaaaatg actggatagg gggactgctt gagacttttc ttttgggcat tactaacaga 120
attcaaagaa attccaacca cgcttatttt tccaaattct actgaaatga gag 173

<210> 504
<211> 310
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(310)
<223> n = A,T,C or G

<400> 504
tagtattcta tttaaaaatt aagttttggg gtctgtaaaa tatacaggac aatgactttt 60
ttaaaatgta agttaatacc tcctcctcac ttgtcttaat tgaacttagg tgtttattct 120
taaaggngga ccttgatgaa aatgttgaga tgggaagtgt tattaggcaa aacttgttat 180
agatttctca tataactctt aattgaccct tagaatttta acaaccgcgc ctggcccaat 240
agactgtttt ttagagtant tttaggctct cancaaaatt gaggggaaaa tacagggtgt 300
tcccattaaa 310

<210> 505
<211> 530
<212> DNA
<213> Homo sapien

<220>

<221> misc_feature
<222> (1)...(530)
<223> n = A,T,C or G

<400> 505
cctcagggaa cttacaatta tggcaaaagg ggaaggggaa gcaagcacct tcttcacaag 60
gcatcaggag agagagagaa agagagtagg ggaaactacc ccttttaaac catcatatcc 120
tgtgagaact ccctcagtat tagaagagca tgagggaaac cgcctccata atccaatcac 180
ctcccaccag gaccatccct caatacatgg gggttacaat tcaagatgag gttcgggtgg 240
ggatacagat ttaaaccata tcagaatggt taatgatatt gttgtatttt accaactata 300
atcttcttag tgttatagta caataatgta aaaaattgag taaatttgtt ttctatatta 360
ttctgttttt ggaaaacatg tatatagtca gggctgtttg tctcaagaaa atatggtaaa 420
ctctgctgtt ttggtcactg gtgcctagaa tttggggatg tacattggtt ttgattcaca 480
tgcacatttc cttctagttc acagtaacta tttctaacta tttcccnata 530

<210> 506
<211> 352
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(352)
<223> n = A,T,C or G

<400> 506
cttgaacgct ttcttaattg gtggctgctt ttaggcggta ctatgggtgn taaatttttt 60
actctctcta caaggttttt tcctagtgtc caaagagctg ttcctctttg gactaacagt 120
taaatttaca aggggattta gagggttctg tgggcaaatt taaagttgaa ctaanattct 180
atcttggaca accagctatc accaggctcg gtaggtttgt cgcctctacc tataaatctt 240
cccactattt tgctacatag acgggtgtgc tcttttagct gttcttaggt agctcgtctg 300
gtttcggggg tcttagcttt ggctctcctt gcaaanntat ttctagttaa tt 352

<210> 507
<211> 370
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(370)
<223> n = A,T,C or G

<400> 507
cctaactaga tcttatcaga atagggggga agggngtcgg ttcatcctta ttgagtgtta 60
atgaccctgt aagatgtaat ttcttttatt tcattctgtt acctagaaaa tctatcacag 120
ccttgtagta ttgattgctc aatctataaa gagctcagtt tacagcatga ctgttagtaa 180
cagggntatt ttaatgagtg actcttcaac acctcagagt ttcactaaat tccaacccat 240
cagcccagta gtctaacatt aagggtctta ggaaatgaga acttatcacc tttccttatc 300
atgaaaaggt aacctccagg taaccaaaaa tagaacttcc tctgtgttcg ttttttatag 360
aaattactgg 370

<210> 508
<211> 129
<212> DNA

<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(129)
<223> n = A,T,C or G

<400> 508
ctgttaaaag aacaaactta gcaatatata acagttnggt aacaggattt ttgactattc 60
actttgggag ttatttttaa aaatccactt ttttactgag tcttactaca taccaggcac 120
tgtacttgg 129

<210> 509
<211> 422
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(422)
<223> n = A,T,C or G

<400> 509
ntgggaagtc gtgacatcca tgggaaccca gcgctgtgat gctggtgttt gngttctccg 60
cgagaagtga ccattgttgg agcaccatcc agagctagtg accantncag tggacagtta 120
gtgggagaat caaaaatcct ttccagaatg tctgtttctc actacntgca ccgggngatt 180
acaggcacca gtgcagngat gattgtactt atttgacaca tactccccgt cntcctggnt 240
nttgttcctg anaanggtgg gtaaatattc caggaaaaan aatgcacatt gaatggatgt 300
gagagaccac attgcctctc ccactgcttt ggggagcact ttcctgtcat ttctaactta 360
ccacntgctt ggtgtactat atgtatgttg tgcctcatat gttgcaaaga actaangtga 420
gt 422

<210> 510
<211> 238
<212> DNA
<213> Homo sapien

<400> 510
ccacctatga attggtggtt tacctactca atggatagca gcacgaggac tgctgtactg 60
cacaaaaaga agaccaaaag attacagtgg accatgggat acagaagcca gcatggcaga 120
cagaagaaaa atagtttggg aacatgtaac tatcctaagt ggaagttttg ttgtaggaat 180
tatagtaatc acaccacatt acttggcctt tcggtaatgt gaaaaaaaaa aaaaatcc 238

<210> 511
<211> 254
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(254)
<223> n = A,T,C or G

<400> 511
ccnattgatt tgatggtaag ggagggatcg ttgnggctcg tctgttatgt aaaggatgcg 60

tacggatggg agggcgatga ggactaggat gatggcgggc aggatagttc agacggtttc 120
tatttcctga gcgtctgaga tgttagtatt agttagtttt gttgtaagng ttaggaaaag 180
ggcatacagg actaggaagc acgataagga aaatgactat gagggcgnga tcatgaaagg 240
tgataagctc ttct 254

<210> 512
<211> 269
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(269)
<223> n = A,T,C or G

<400> 512
cctacctgta aactacagta ctttatatat ctatgggntt aataaaaana aaatccacaa 60
atcttaaaaa ggaactttaa atgcagggct atattgaatt ggnaaactgc aacacaaact 120
ggcgcaacat aggtaaatga ataccaatct cactctatgt gatgcaagca tgctactttc 180
ccactaattt aaattacttt caaccactat gagccagaat gcatgcctga accttaaact 240
gcactttaaa aagtaacatc ttggcctaa 269

<210> 513
<211> 266
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(266)
<223> n = A,T,C or G

<400> 513
ggaggggggt tgttaggggg tcggaggaga aggntgggga acagctaaat aggttgttgt 60
tgatttggtt aaaaaatant agggggatga tgctaataat taggctgtgg gtggttgtgt 120
tgattcaaat tatgtgnttt ttggagagnc atgncantgg tagtaatata attgttgaga 180
cgattagttt tagcattgga gtaggtttag gttatgnacc gtactctagg ccatatgtgt 240
tgganattga nactagtagg gctagg 266

<210> 514
<211> 271
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(271)
<223> n = A,T,C or G

<400> 514
acatgcaana aatcgagaat cttaaaaaac annacgaanc tgccctggaa nncttactgg 60
nntangatat ttatnttgcg gctgagatac ttgaacaact tcggatcnga antagacaan 120
aangggnant tntatactgc nncagaggtt acacagntca ttgtattaga gangaacana 180
tgggtctggt gttcacacat tgggggggaan atgggcgtnn acangagagg nnganaaacn 240
anganagcct ncctggttng cataanaaaa a 271

<210> 515
<211> 328
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(328)
<223> n = A,T,C or G

<400> 515
ccaatgaggg gcaaagtgag cgncnagaag angttttgac tgaaataaat caaacacaaa 60
aatntaagtt cacagtgaca gtttaaacaa aatccaaaca aactaacaac anaaacaccc 120
cttgntttgc ctctagtgga aggtgggana acacaanctc gtcctaaaaa ttgactagta 180
aaggggaaaa cccggtcatt tncctactct ttccangaaa tatctaatgc aagaaagaac 240
ttctnctcat tatacngaag gaatttngaa aaatgatgta tttttggaac acctaantga 300
aatactggaa cctgggcaag ttcaccac 328

<210> 516
<211> 220
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(220)
<223> n = A,T,C or G

<400> 516
ncctnagttg aaggacccca tgtacataca ggccagggga gcagtactag gntaactaga 60
aggatctcat ccccatatgt gggctcattt caagtctatg gatgactacc ttcattgntg 120
tgtgcgagat ggtttcaccc cttgaaaata tgggcacttc ancataanat agcnaaatct 180
ttataatgat caatncatcc tacctccttt tacatgcatg 220

<210> 517
<211> 296
<212> DNA
<213> Homo sapien

<400> 517
tgcgatttct tccttgttgt ttgctttggt ctgtgttcaa tccagagagc ttaaattgtc 60
attattttgg gaagaaaacc tgtatttttg ttagtttaca atattatgaa atttcacttc 120
aggagaaact gctgggcttc ctgtggcttt gttttcttag tttctttttc cgtgccgtgt 180
atttttaat tgatttttct tcttttactt gaaaagaaag tgttttattt tcaaatctgg 240
tccatattta cattctagtt cagagccaag ccttaaactg tacagaattt ccactg 296

<210> 518
<211> 299
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(299)

<223> n = A,T,C or G

<400> 518
gaagatagaa aaatataaag ccaaaaattg gataanatag cactgaaaaa atgaggaaat 60
tattggtaac caatttattt taaaagcccg tcaatttaat ttctggtggt gcagaagtta 120
gaaggtaaag cttgagaaga tgagggtgtt tacgtagacc agaaccaatt tagaagaata 180
cttgaagcta gaaggggaag ttggttaaaa atcacatcaa aaagctacta aaaggactgg 240
tgtaatttaa aaaaaactaa ggcagaaggc ttttggaaga gttagaagaa tttggaagg 299

<210> 519
<211> 464
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(464)
<223> n = A,T,C or G

<400> 519
gctgcacatc ggaggaaaac tcggtaaagc agaatgaggt tgatatgttg aatgtatttg 60
attttgaaaa ggctgggaat tcagaaccaa atgaattaaa aaatgaaagt gaagtaacaa 120
ttcagcagga acgtcaacaa taccaaaagg ctttggatat gttattgtcg gcaccaaagg 180
atgagaacga gatattccct tcaccaactg aatttttcat gcctatttat aaatcaaagc 240
attcagaagg ggttataatt caacaggtga atgatgaaac aaatcttgaa acttcaactt 300
tggatgaaaa tcatccaggt atttcataca gtttaacaga tcgggaaact tctgtgaatg 360
tcattgaagg tgatagtgac cctgaaaagg ttgagatttc aaatggatta tgtggtctta 420
acacatcacc ctcccaatct gttcagttct ccagngtcaa aggc 464

<210> 520
<211> 221
<212> DNA
<213> Homo sapien

<400> 520
ctgatatcta cttatttaac acaagtctct aatacaatac aattttatta attttattcc 60
acatgcccca cattagatct ctagactcat tcatcctaca tacctacttt gtatcctttg 120
acctacatct ccctacttcc tcctccagtc cccacccccc acccactggt gctaaccact 180
gtttcattcc ctttttcatt ctacatatgt gagatcatgc t 221

<210> 521
<211> 312
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(312)
<223> n = A,T,C or G

<400> 521
ctgatagctt tctcttcgcc tagattaata tcttctnnct tcccattcac agcccccacc 60
gacatcaaag ctttgctgtt ttatctgtca aaaatgtctt cacacttttc attcttaaat 120
aaaagtgctg agtaaggaca ttttcacaac aaatttttat tttacaaaac ttacaatgat 180
ttgaatccaa aacaactttc attatttaac tgtaaagtaa atatatattt tattaggngt 240

```
gtcttagttc attttgtgct gctttaacag tgtatccttg tgatagttgt ggggtggggg     300
aggggggaag ga                                                         312

      <210> 522
      <211> 336
      <212> DNA
      <213> Homo sapien

      <400> 522
ccttctttcc ccactcaatt cttcctgccc tgttattaat taagatatct tcagcttgta      60
gtcagaccca atcagaatca cagaaaaatc ctgcctaagg caaagaaata taagacaaga     120
ctatgatatc aatgaatgtg ggttaagtaa tagatttcca gctaaattgg tctaaaaaag     180
aatattaagt gtggacagac ctatttcaaa ggagcttaat tgatctcact tgttttagtt     240
ctgatccagg gagatcaccc ctctaattat ttctgaactt ggttaataaa agtttataag     300
atttttatga agcagccact gtatgatatt tttaag                               336

      <210> 523
      <211> 172
      <212> DNA
      <213> Homo sapien

      <220>
      <221> misc_feature
      <222> (1)...(172)
      <223> n = A,T,C or G

      <400> 523
ngacnggtnc ntggctatgt ntatagatag ggctttaacc actatctgng aagcangagn      60
gacannattc ttgctctcac atnccacngg anacgtattt ctcttctctt acnagcgaag     120
aaccatctnt ttctaaagcc cccattctat tgcccttgct tttctctggc tt             172

      <210> 524
      <211> 471
      <212> DNA
      <213> Homo sapien

      <400> 524
ccagacctgc agaaaaactt agcacagctc aatctgctgt tttgatggct acagggttta      60
tttggtcaag atactcactt gtaactattc caaaaaattg gagtctgttt gctgttaatt     120
tctttgtggg ggcagcagga gcctctcagc tttttcgtat ttggagatat aaccaagaac     180
taaaagctaa agcacacaaa taaaagagtt cctgatcacc tgaacaatct agatgtggac     240
aaaaccattg ggacctagtt tattatttgg ttattgataa agcaaagcta actgtgtgtt     300
tagaaggcac tgtaactggt agctagttct tgattcaata agaaaaatgc agcaaacttt     360
taataacagt ctctctacat gacttaagga acttatctat ggatattagt aacatttttc     420
taccatttgt ccgtaataaa ccatacttgc tcaaaaaaaa aaaaaacctt c              471

      <210> 525
      <211> 332
      <212> DNA
      <213> Homo sapien

      <220>
      <221> misc_feature
      <222> (1)...(332)
      <223> n = A,T,C or G
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<400> 525
ccccnctgta ttccagcctg ggtgacccca tctcanggaa gaaaagttac cagatgtcgn 60
gggtaaaggt tggtcttcaa gtggcctcat aagttgtctt gcatttaaat tcagggaatt 120
cattggacca ataggttaca ttttcgttcc tttttgttt tggttcatct gttaagcagt 180
gggggcctaa ttactgctcc tttgtaaaaa cacattttcc caaagaacac tgaattaccg 240
ttcaaactgg ttgttgatgg gtaataaggg ctgtttttgc tgccccaaaa gggcttaaca 300
atttaggcgg atagtttact taaaaaaaaa aa 332

<210> 526
<211> 440
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(440)
<223> n = A,T,C or G

<400> 526
ccaggttacc tcccctaaca gatgtggtgt tctgangggt tggttaagtg cccgaggaaa 60
ataggcctta actgttaaca tctacagaga agaaagcatg gtcacactgg caaggagtaa 120
gaagggattg ggtaaaagaa aatgggagag aaaagggaaa aaagtttgg caagacaatt 180
gttccctgct aagaagctgc agggtgaaag ctttcctttc ttctattttt gtttttaatg 240
nctgtctctc tgatcagngg aaaagtgaaa atttctagta tctagcacta acgtatgacc 300
caactttgag ggatcacaag ctagaacaag ttgaggattt aaaatcctgg ataattatat 360
acttaaagtt catgagcata aagctcactt gaccatgcag aaatgctggg aagcagggtg 420
catggcatgg gaatacatct 440

<210> 527
<211> 124
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(124)
<223> n = A,T,C or G

<400> 527
tttccatatg tctgttgggt gcataaatgn cttcttctga gaagtgtctg ttcctatcct 60
ttgccccctt tttgaggact taaatgttag acctaagacc ataaaaaccc tagaagaaaa 120
ccta 124

<210> 528
<211> 162
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(162)
<223> n = A,T,C or G

<400> 528

ctgcgggaga aatatgggga caagatgttg cgcangcaga aaggtgaccc acaagtctat 60
gaagaacttt tcagttactc ctgccccaag ttcctgtcgc ctgtagtgcc caactatgat 120
aatgtgcacc ccaactacca caaagagccc ttcctgcagc ag 162

<210> 529
<211> 409
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(409)
<223> n = A,T,C or G

<400> 529
cctttaaaat atagcttata aaatgtatac tatnngccag gagagctcac atttttctgc 60
agttttccag tggacctgcc tatggaatac tgtaaagaaa aatctgcaaa aatattccta 120
gcaattgaat cagtgctttt aaataaaaga agtggagagg ggcttggtta aattattctg 180
acaagtttc ttgctagtgg ttgccaaaat taaggatatt tgaagtgtcc tatcacccaa 240
atttggcttt aagaaaaagc tatattctgn gtctataggg tgaagcccac actatctgtg 300
ctgcattctc aatgatacaa tacctatctg gaaactttcc tgttttgcca atgggtgcac 360
aaatctaaaa cattttatca caaaaggtac ttgaatttaa atttctttt 409

<210> 530
<211> 325
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(325)
<223> n = A,T,C or G

<400> 530
ccgccagtgt gatggatatc tgcagaattc gccctttcna gatttgngcc cgggcaggtc 60
catggctagg attatagata gttgggtggt tggggnaaat gagtgaggca ggagtccgag 120
gaggttagtt gtggcaataa aaatgattaa ggatactagt ataagagatc aggttcgtcc 180
tttagtgttg tgtatggcta tcatttgttt tgaggttagt ttgattagtc attgttgggt 240
ggtaattagt cggntgttga tganatattt ggaggtgggg atcaatagag ggggaaatag 300
aatgatcagt actgcggcgg gtagg 325

<210> 531
<211> 173
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(173)
<223> n = A,T,C or G

<400> 531
ccaattgatt tgatggtaag ggagggatcg ttgaccncgt ctgttatgta aaggatgcgt 60
agggatggga gggcgatgag gactaggatg atggcgggca ggatagttca gacggtttct 120
atttcctgag cgtctgagat gttagtatta gttagttttg ttgtgagtgt tag 173

<210> 532
<211> 395
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(395)
<223> n = A,T,C or G

<400> 532
caggtcctac tatgggtgtt aaatttttta ctctctctac ngggtttttt cctagtgtcc 60
aaagagctgt tcctctttgg actaacagtt aaatttacaa ggggatttag agggttctgt 120
gggcaaattt aaagttgaac taagattcta tcttggacaa ccagctatca ccaggctcgg 180
taggtttgtc gcctctacct ataaatcttc ccactatttt gctacataga cgggtgtgct 240
cttttagctg ttcttaggta gctcgtctgg tttcgggggt cttagctttg gctctccttg 300
caaagttatt tctagttaat tcattatgca naaggtatag gggntagtcc ttgctatatt 360
atgcttggnt ataatttttc atctttccct tgcgg 395

<210> 533
<211> 290
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(290)
<223> n = A,T,C or G

<400> 533
ctgaaccatt atgggataaa ctggtgcaaa ttctttgcct tctctacttc tcactgattg 60
aacataagct tccagggctc ccctgaaaac caaaatgaaa acaatgtcaa aatattagat 120
aaatcacata aaacagttaa ggggatacca atatataaaa attattaggt aagctcattt 180
ctggaactgt taatgctcgg tttcacaatc caagnngacc aacagccttc actcagntac 240
tggnagtgnt actatggtta ctacngntac tacctttagt gtnaaaaact 290

<210> 534
<211> 334
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(334)
<223> n = A,T,C or G

<400> 534
ccgccagtgt gatggatatc tgcagaattc gcccttagcg agnnagccgg gcaggtccat 60
ggctaggttt atagatagtt gggtggttgg tggggnatga gtgaggcagg agtccgagga 120
ggttantttg tggcaataaa aatgattaag gatactagta taagagatca ggttcgtcct 180
ttagtgttgc gtatggctat catttgtttt gagggtagnt tgattagnca ttgttgggng 240
gtaattantc ggctgttgat ganatatttg gaggtgggga tcaatanagg gggaaatana 300
atgatcagtn ctgcggcngg tnngacctcn gccc 334

<210> 535
<211> 557
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(557)
<223> n = A,T,C or G

<400> 535
nccataagct tcagtgcgca aaaggtcaag gccagtgtta atttgttatt tcttaaataa 60
ctttcccttt catttttaaa ttataaattt aacttctaac atgttttatg gttaaaattg 120
tactttttc ctttagcgac attcaaatgc atcacaatca ctttgtgaaa ttgttcgcct 180
gagcagagac cagatgttac aaattcagaa cagtacagag cccgaccccc tgcttgccac 240
tctagaaaag tatgtgtaaa actctgttct tgttcttctt tcatattgat gctgttccat 300
gtgttaccat tgtgagtggt tggtaagtgt tccttatgtg ggaatcatgt gccttgaaaa 360
taaccttggg tgggtgagaa ggtagggaaa cctgcttctt ttatctcaag taaaagtttt 420
ggcagggtaa agaagataaa tgacatttat atctagactt ttgagttttc caattatttg 480
gtaaaaatgg gaaattctgt agaagcccct ccttaaaaat gggggaagtc catttnanaa 540
aattaactgg taggtca 557

<210> 536
<211> 372
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(372)
<223> n = A,T,C or G

<400> 536
gttccaacct tcatttctga aactgttcta gagcacngtg tctttctcgt agttcataac 60
ttacccctc agtctagaat tagaattaca ttatctgttt tactacttta ctagactgta 120
agctcctaga agataaggac tagggagttc atctctgtat tccaccagaa ggtacagtga 180
ctcatatcta gagtctttag atgaaactta ctgagttgaa taacttaata tatttctgtt 240
ttcattccca agggaggcca tgtctggaga tagaccttga atttaataaa ttttaggcac 300
tataccattt cagtggagaa aattgttggg aaatttgggg ggatggatat ataaggggga 360
ggaagtcact gg 372

<210> 537
<211> 284
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(284)
<223> n = A,T,C or G

<400> 537
ccttctgatg caaacagaaa ggaaatgttg tttggangcc ttgctagacc tggacatcct 60
atgggaaaat ttttttgggg aaatgctgag acgctcaagc atgagccaag aaagaataat 120
attgatacac atgctagatt gagagaattc tggatgcgtt actactcttc tcattacatg 180

actttagtgg ttcaatccaa agaaacactg gatactttgg aaaagtgggt gactgaaatc 240
ttctctcaga taccaaacaa tgggttaccc agaccaaact ttgg 284

<210> 538
<211> 293
<212> DNA
<213> Homo sapien

<400> 538
gtacatagta ggtgtatata tttatgggct atataagatg ttttgataca ggcatgtaat 60
gtgaaacaag cacatcaaca agaatggggt atccatcccc taaaacattt gtcctttggg 120
ctacatgtca tttcctaatg taaagaaaat ggacagacag aaccaacatt gatttgactg 180
ggtgaaaaag tccatttgag ttgggagcag gggttgtgtt cctggatttg ggttgttagg 240
acagtgtaaa aaggcttcac aggggaacat tcttttctga taaaggaaag cag 293

<210> 539
<211> 468
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(468)
<223> n = A,T,C or G

<400> 539
tttcnataaa ctttattttt agagcagttt taagnnggta gcaaaattga ttagaaggna 60
cagagatgtc ccatacacct cctactccca cacatgcaca gccttcccca ttatcaatag 120
cccccaatag agggatacat ttgttaacaa ctgacgaacc tacatatcat tatcacccaa 180
agtccacagt ttatattatt ccttctggag aattttcaaa tacagaaatt cctctaccag 240
gaataaacta ncaatttcct ctcggctttc tataaattta attattattt cagaaattag 300
cctatcttta caggagaaaa tgttataaac catgaaaaga ctatcaaata cacaaggaag 360
tgaatgntat ataaaaaatg taccatctcc taaacaacta cctgcattcc cttcttgttg 420
gtaagttata atttgnnata gttctgatca tctgtttaat taatttgc 468

<210> 540
<211> 397
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(397)
<223> n = A,T,C or G

<400> 540
ctgttttatt aattccccca tttgcagcac acttntctct tccaacattc atcagtcaga 60
tcagagtcca cggtcttttc aaaatttaga taaactggct tacattttgt aatgatgtcc 120
ccagacaaca ccccactcca acccattctg tttgttacta ttagtttaca acatgcatgt 180
gcctttactt tcattttcat agtatttaaa aatggaaggg cactcccaaa tttactttaa 240
ccccttttaat aatctctctc ctcctgctct ctctggtcct ccagacaact gttgatttac 300
tttcctttat gatggattag tttgcatttt ctagaatttt atatgactga catataaagn 360
ttttatgttt ctcccctttg ggtttcttca tgtggca 397

<210> 541

<211> 248
<212> DNA
<213> Homo sapien

<400> 541
cctagatagg ggattgtgcg gtgtgtgatg ctagggtaga [illegible] [illegible] 60
taaaatgtgc atagtggggg ttttatttta agtttgttgg ttaggtagtt gaggtctagg 120
gctgttagaa gtcctaggaa agtgacagcg agggctgtga gttttaggtg gagggggatt 180
gttgtttgga agggggatgc gggggaaatg ttgttagcaa tgagaaatcc tgcgaatagg 240
cttccggc 248

<210> 542
<211> 366
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(366)
<223> n = A,T,C or G

<400> 542
aatcggccct ctagatgcat gctcgagcgg ccgccagtgt gatggatatc tgcagaattc 60
gcccttgagc gatancgcgg gcaggtccaa ttgatttgat ggtaagggag ggatcgttga 120
ccncgtctgt tatgtaaagg atgcgtaggg atgggagggc gatgaggact aggatgatgg 180
cgggcaggat agttcagacg gtttctattt cctgagcgtc tgagatgtta gtattagtta 240
gttttgttgt gagtgttagg aaaagggcat acaggactag gaagcagata aggaaaatga 300
ctatgagggc gtgatcatga aaggtgataa gctcttctat gataggggaa gtagcgtctt 360
gtanac 366

<210> 543
<211> 460
<212> DNA
<213> Homo sapien

<400> 543
cctactatgg gtgttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga 60
gctgttcctc tttggactaa cagttaaatt tacaagggga tttagagggt tctgtgggca 120
aatttaaagt tgaactaaga ttctatcttg ggcaaccagc tatcaccagg ctcggtaggt 180
ttgtcgcctc tacctataaa tcttcccact attttgctac atagacgggt gtgctctttt 240
agctgttctt aggtagctcg tctggtttcg gggtcttag ctttggctct ccttgcaaag 300
ttatttctag ttaattcatt atgcagaagg tataggggtt agtccttgct atattatgct 360
tggttataat ttttcatctt tcccttgcgg tactatatct attgcgccag gtttcaattt 420
ctatcgccta tactttattt gggtaaatgg tttggctaag 460

<210> 544
<211> 116
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(116)
<223> n = A,T,C or G

<400> 544
ccgccagtgt gatggatatc tgcagaattc gcccttgga gngctngcgc ccgggcaggt 60
ctgtttcagc agctcctcct tcttcttccc gcgangatct cgagccttga tcttgg 116

<210> 545
<211> 380
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(380)
<223> n = A,T,C or G

<400> 545
cgacggatcg atnagctnga tatcgaattc ggacgagcat ggcgtattgc tgcagatatg 60
gattcttcag aatgctccat gacaaatgta ctgacgggaa gncnatctaa aggaggcatt 120
gtnatgagag aaaggtctcg agctccagat aaagagagat acagagttct tggaattgga 180
gttgcagaaa cagtaagaca atcgattgtg gggaagcgtt cttttagaga atctttggcc 240
ttcactccaa agcgttgttc ttcatcaata ataagtagct cgtgccgaat tcctgcagcc 300
cgggggatcc actagttcta gagcggccgc caccgcggag gagctccagc ttttgttccc 360
tttagtgagg gttaatttcg 380

<210> 546
<211> 418
<212> DNA
<213> Homo sapien

<400> 546
ccagggcaat taggcaggag aaggaaataa agggtattca attaggaaaa gaggaagtca 60
aattgtcccct gtttgcggat gacatgattg tatatctaga aaaccccatt gtctcagccc 120
aaaatctcct taagctgata agcaacttca gcaaagtttc aggatacaaa atcaatgtac 180
aaaaatcaca agcattctta tacaccaata acagaccaac agagagccaa attatgagtg 240
aactcccatt cacaattgct tcagagaata aaatacctgg gaatccaact tacaagggat 300
gtgaaggacc tcttcaagga gaactacaaa ccactgctca aggaaataaa agaggataca 360
aacaaatgga agaacattcc atgctcatgg gtaggaagaa tcaatatcat gaaaatgg 418

<210> 547
<211> 172
<212> DNA
<213> Homo sapien

<400> 547
cctgaggttg ggagaaattt tgtccatttc tttagaacca aaattggcaa ccagagagta 60
tttggatgtt acacaaaata tctagtttcc ctttctagcc taaattgggt tgtttatagc 120
acccgtctct ccatttgaga aaaatggtta ggatgctggt gcagggatga gg 172

<210> 548
<211> 367
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(367)

<223> n = A,T,C or G

<400> 548
ggtctgactt aagagaaaca atggaaggca agaggcagta gaataatata ttcaaaagat 60
gcaaaggaaa aaaacctctc agccacgaat tccttatcca gcaattattt ttcaaaaatg 120
aaaataacac aaagacttag ccagataaac agaaacatta actgaagctg ttgcctggag 180
acctaccata taaaaataaa aaactctaaa aaaattccta tggctaaaag caagttacag 240
aagacagtca cttgaatcca cattttaaaa aaagcactga tatacgtaat attgacatta 300
taaaagacag taaaaatgca tttcttcttt ataataaatn gcttattaaa taacatgtgt 360
ataatgg 367

<210> 549
<211> 418
<212> DNA
<213> Homo sapien

<400> 549
ccaaatcaga acctagagtg agcattctat aaactcacct ttgctttgat ccttgaagat 60
cacaagtttt gatactgttg aaatctctac tctttcaaca ctttaattaa atggcattta 120
gaatttcata tacttctgtt gttgtttcca caatcttaaa ctggatttag aaatacttat 180
aatgtaaatg caagagcttt aacttagtaa ccgtatttcc tatttttgt tgtttttctt 240
ttgccagaat ttctgtttgt ctacaataaa gtccagcgaa atacagtatt tggttaggtt 300
acttgttaac ataaaatttt atcatttgta gagtttttac ttaaccttcc tattctctag 360
tctctataat ctttcaatga agataaccag ttacgaatat ctcctatacc atattagg 418

<210> 550
<211> 234
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(234)
<223> n = A,T,C or G

<400> 550
cctacccgcc gcagnactga tcattctatt tccccctcta ttgatcccca cctccaaata 60
tctcatcaac aaccgactaa ttaccaccca acactcacaa caaaactaac taatactaac 120
atctcagacg ctcaggaaat agaaaccgtc tgaactatcc tgcccgccat catcctagtc 180
ctcatcgccc tcccatccct acgcatcctt tacataacag acgaggtcaa cgat 234

<210> 551
<211> 542
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(542)
<223> n = A,T,C or G

<400> 551
cacccctacc ccnntcctca taaaagttnc tctccctgga tcctcttttt ccctcatgag 60
tgcccggttg cccaagtcaa aaacctggga gtgatataaa ctcccccacac atccagtcag 120
tcactcatca actctattga ttctgtctgc taaatatatn tcaattgtat taacttaaac 180

atatgcatan ggcactttct tcttcactgc atttttgtgg gctgcactta cctttcaggt 240
aacgacaaca ctggcccctc ttgcccttct agtcagaagt gccaaaatga tgagagctag 300
ccatgacaaa cccacagcca acattacact gaatgtgcaa aactggaagg gcatccaaac 360
agaggagggg agagaggaat agacaggaag tcaaactgtc tctgtttaca gatgacatgt 420
ttctatatct ataaagcccc atagtcttgg ccccaaagct tcttctgctg ataaacttta 480
gcaaagtctt agcatacaaa atcaatgtgc aaaaattact aacagtccta tacatcaagt 540
ca 542

<210> 552
<211> 411
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(411)
<223> n = A,T,C or G

<400> 552
cctggntgac aaggaggtgc ctgtnatgtg aagatttgag gaaagagcat tccaggcagg 60
gggaaggctt gatgcaaagg gtctactgca ggcattagct gagcttattt aaagatcaga 120
atgaaggcca ttgtggctag aacagagtgg acaggaagga atggtaccag gcaaagctga 180
agaagttggc aggattgagc tctcataant catggcaaag agttcccatt tcattgtttg 240
acggaaataa attggaaggt cttaagtagg agaagatttg attagattta cattttacga 300
agaagcactc tggatgttat gtgaagaaat ggcctttgca gggcaagggt ggaaacaaag 360
agatcagtta ggaaattatt ggagtagctg aggattggat gaggggatgt g 411

<210> 553
<211> 631
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(631)
<223> n = A,T,C or G

<400> 553
ccgggattag aactaaaaca agtgagatca cccctctaat tatttctgaa cttggttaat 60
aaaagtttat aagattttta tgaagcagcc actgtatgat attttaagca aatatgttat 120
ttaaaatatt gatccttccc ttggaccacc ttcatgttag ttgggtatta taaataagag 180
atacaaccat gaatatatta tgtttataca aaatcaatct gaacacaatt cataaagatt 240
tctcttttat accttcctca ctggcccccct ccacctgccc atagtcacca aattctgttt 300
taaatcaatg acctaagatc aacaatgaag tattttataa atgtatttat gctgctagac 360
tgtgggtcaa atgtttccat tttcaaatta tttanaattc ttatgagttt aaaatttgta 420
aatttctaaa tccaatcatg taaaatgaaa ctgttgctcc attggagtag tctcccacct 480
aaatatcaag atggctatat gctaaaaaga gaaaatatgg tcaagtctaa aatggctaat 540
tgtcctatga tgctattatc atagactaac gacntttatc ttcaaaacac caaattgtct 600
ttagaaaaat taatgtgatt acaggtagag g 631

<210> 554
<211> 558
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(558)
<223> n = A,T,C or G

<400> 554
ccaggntagt ctccaactcc tgaccttagc tgatccaccc acctcggcct cccaaagtgc 60
tgggattaca ggcatgagcc actgcgcccg gccaaacttg atatgcattt ttaaataagt 120
taatacatta ttcatggttt agtctcatta tatattctat ggtccacttt gaaatttcat 180
ctaaccaaaa tcatcttcat cctgcaattt gaggtttgga cacaatgggg attgatcagt 240
aatttcttca tatgcccttt ctcaaggaaa tagtttccta tgaaaaaaaa gtcctatgtt 300
ttcatgtaag ttctcttttt ggagaagaaa aggagacatt cttacttagc actctcagtt 360
ttacaaaacg ctgccaacct taaaatttgt ctattgattc ccaaggcaca caaccaatag 420
tctgtcaata acccggaata acatttcttt aaggccccag taactttcac atgtttgggt 480
tccaatcctc acctagaatc ttgttaagaa aagtaaacca ttcactcctc tagaaactct 540
aaggttgctt cttagggg 558

<210> 555
<211> 212
<212> DNA
<213> Homo sapien

<400> 555
ccaggtattt gcataatggc ttttcttctg ttgcctttgt tcctttgtgg ccccagctaa 60
ttgcctgaga gtgccactgt tagttttcaa ctctttctga tagaaaccct gtgtactaac 120
atggaaatct taggtaatct gctttttcaa agcacaatgc agaatttatt ggcggtggtg 180
taactttaag aatatccgag aagccaccaa gg 212

<210> 556
<211> 219
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(219)
<223> n = A,T,C or G

<400> 556
ccatgtgtct atctggagag aaggggaaac agcaagtgca aaggccctga gatggaacat 60
atctggagaa ttcgaagaat ggtaagaagg ccagagtgga gcagaacaag tgtgggagag 120
agttgtagga gatgagatca aaggctagga atgaagtgta aggccatgtc atgtgacctt 180
gtatgtcctt gtaaggcttt tttttttttt tttnancct 219

<210> 557
<211> 482
<212> DNA
<213> Homo sapien

<400> 557
cctactatgg gtgttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga 60
gctgttcctc tttggactaa cagttaaatt tacaagggga tttagagggt tctgtgggca 120
aatttaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggt 180
ttgtcgcctc tacctataaa tcttcccact attttgctac atagacgggt gtgctctttt 240
agctgttctt aggtagctcg tctggtttcg gggtcttag ctttggctct ccttgcaaag 300

ttatttctag ttaattcatt atgcagaagg tataggggtt agtccttgct atattatgct 360
tggttataat ttttcatctt tcccttgcgg tactatatct attgcgccag gtttcaattt 420
ccatcgccta tactttattt gggtaaatgg tttggctaag gttgtctggt agtaaggtgg 480
ag 482

<210> 558
<211> 679
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(679)
<223> n = A,T,C or G

<400> 558
ctgtnaaaat tctgaaccta tccccaaaag aaaaaccgtg aaatacaagt tttaggaggt 60
ggagcaaaga aaagccaagt tatttaaaac caataaacac aagagacaat tctgctggag 120
aatttacttt ctccaaaaca tcaaatggac tttaaagcag aagaccacat tttatgagaa 180
agttatgtca ctgaaaagct tcatgtaaag tgactttgta aatggaatat ttttaaatga 240
taaaaagaaa ataacttttc caggaatcct ttggagaggc tgataaccag atattaaatt 300
atcaatttg ccaaagtgga cttttaaaaa atgtgttact tttaaaaact aacttgaaag 360
aatttatgag gcaatctatc tgagtatgtt tattgttgct ccattggctt tcaggatttt 420
ggtcatttca ctgttaactc ttacatcaga gaataaagaa aagaaaatga aactttgtta 480
ggaactggga tggaaaatgt agtcccagac agatctactg acctcgactg agtttcagaa 540
atatcccagg attttggtta ttcatgcctt tcttttgtga ctttctttca aattagccaa 600
ttaaagatac cccttcaatc accggtgaca tcagtacaac agtttttcaa cagttttctc 660
tctcctgacc aaacagttt 679

<210> 559
<211> 488
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(488)
<223> n = A,T,C or G

<400> 559
ccccactgta ctccagcctg ggtgacccca tctcaaagaa gaaaagttac cagatgtcat 60
gggtaaaggt tggtcttcaa gtggcctcat aagttgtctt gcatttaaat tcagggaatt 120
cattggacca ataggttaca ttttcgttcc tttttgttt tggttcatct gttaagcagt 180
gggggcctaa ttactgctcc tttgtaaaaa cacattttcc caaagaacac tgaattaccg 240
ttcaaactgg ttgttgatgg gtaacaaggg ctgtttttgc tgccccaaaa gggcttaaca 300
atttaggcgg atagtttact taaaaaaaaa aatcctttgg agacatactg aaaatgcaaa 360
ctagtttcta aattatcaat tccctacatg aanaagcagt ttgccanagt ttagtctcan 420
aaaatgactg gttggctcta tttaaatcan aacccaattt ctacgcacct gcccgcccgg 480
ccaagggc 488

<210> 560
<211> 602
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(602)
<223> n = A,T,C or G

<400> 560
cctanttaag aattccttgc cttagtggtg aacaaggact aaacacagac aatgggtgaa 60
acacagacgc taattcacat aacagagagt aggcaacctt aagaatgaat tgatgcagac 120
tcctatagaa ttcctctgtt atgactgggt tcttattttc tcctccttgt atgtagttga 180
aatttcatca ttatgaatag ttccttggat ctttttttaa agttgtgaat gcgagtgttt 240
ggctttgtaa tacaactttt tagtatccag aagataacca gtgctctacc aataaagatc 300
ttttgataca aagggtttta acttctgcca gttcttactc atttttttca ggttttttat 360
acatttctta aacaacacat acattatgta aaatataaga attaatgtac attctcaagg 420
ccagattcag tgacaaaatg cactacccga atctagtaac acatttactc cttgctgcat 480
ataagtggcg tgtaagaaat acagggtata ttgttttgtg atccatgcag taaatgttca 540
caaatatcag gcaaacaact agacgntctt cagctactaa aattaactgt cccagtcaca 600
aa 602

<210> 561
<211> 683
<212> DNA
<213> Homo sapien

<400> 561
gtctattttt aaaaagaaag aaaaaaacca ctttttttata gtccctagct ttgccatatg 60
cccgccttaa gtggaaggaa agttaatcac ttaactatgt tttataaaaa gaaaaaaggg 120
cttggaatgc tattactgtt cacacaaagt atgattctgt ttgaataagg caaatgctcc 180
tttttttaaa aaaagacatt actgtaatat caaaaaccgt ggcagtttgt atacaactct 240
gggcttgatt ttttttaaaa aaacagaatg aattgatgtc ttattttata aatgttctat 300
atttattagg agaaaacttt atattgcctt ttttatcaat catgtaacag gcttatagct 360
ttccaacaga gctgcttgcc aaacaatttt ttttgtttat taaacagtgc tgaaacaaac 420
aggatcagca tttacttaag atgttaagaa tgaggacttt taatcagccg aaccaagata 480
ttgttacctg tatgcattcc caaagtctag atgctcagta tgttcagtca tatctttcag 540
aatcagtgaa ccgattaccc ttttttttggt attcactcta catctgccaa cctagttcac 600
cttggttttg tgtctgctgt agaagggaac cataacttgg ttaaaccgta gggattatca 660
ttgtatacat gctgtgaaca tgt 683

<210> 562
<211> 420
<212> DNA
<213> Homo sapien

<400> 562
gcactttttt tccagtaagg attcatctct tgctctccta tatggtcatt atattttata 60
ttttacatat ttataaacat gacatatgta tttatgttcc acaaagggct ttgaatagaa 120
tttacacata gagttccctg ggttgatgtg tttatcaaaa tggaagataa agtgaattaa 180
ttacttaaat atttaacact attgaataga aataatttcc ccaatattgc ttcatgattt 240
agacagtcta ttaaatgttt aagcaaggca ctagactaag tttattaaga caaattttgg 300
aatatgtgca gaaatatgac ctggctaata gtacagagtc aaagctggtt gaatggtgtt 360
atatagtgga ttcagattga tgtggcagtg gtggttacac taggggcact aaggttatcc 420

<210> 563
<211> 482
<212> DNA
<213> Homo sapien

<400> 563
ctccacctta ctaccagaca accttagcca aaccatttac ccaaataaag tataggcgat 60
agaaattgaa acctggcgca atagatatag taccgcaagg gaaagatgaa aaattataac 120
caagcataat atagcaagga ctaaccccta taccttctgc ataatgaatt aactagaaat 180
aactttgcaa ggagagccaa agctaagacc cccgaaacca gacgagctac ctaagaacag 240
ctaaaagagc acacccgtct atgtagcaaa atagtgggaa gatttatagg tagaggcgac 300
aaacctaccg ggcctggtga tagctggttg ttccaagatag aatcttagtt caactttaac 360
tttgcccaca gaaccctcta aatcccttg taaatttaac tgttagtcca aagaggaaca 420
gctctttgga cactaggaaa aaaccttgta gagagagtaa aaaatttaac acccatagta 480
gg 482

<210> 564
<211> 302
<212> DNA
<213> Homo sapien

<400> 564
ctggaagtga aggtactaat atacaaatgg ctcttgtttc tgaatatgtg atataatttg 60
tgaatctttg gaaactgaat tttttctatg gagtgcaaat atagaagggt tattttacaa 120
tgtttgttgt gaaaagaatt cactttgtaa acaactatta aggctggaag tttagtgaag 180
gtgcatagtt ttgaaagcta cacaggtgaa aaatcaaact tattgtttgt aattttgctg 240
ttacatgtta agttactttg acagcaattt tctaatgata atgtgattta tgatttaaaa 300
gg 302

<210> 565
<211> 554
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(554)
<223> n = A,T,C or G

<400> 565
ccanngtgac atcatggcaa tacagcaaga attctgnnat ttatttagaa gcctcaagga 60
gaaggatcct ggagcccctg aatgagagtt tcttctccat gcctctcccc agtcaaaata 120
catggaaata ttcatagaag cattgtaccc agcatgataa ggaaggatgg agaatggttc 180
cttatatctc tgttcacaag acatcaacac tcttaagtaa ctgtatgaaa taaattctct 240
gctgaaagca aataaaccat ctgaaaggtc ttctggttac ttacacagat ttcctagaga 300
atctgaaatc agcctaacag ggaagattaa tttttaaatg aatccaagtt aatgaaagca 360
aagaactctt atacagaaat acattttcct attataaagc aggactacct tccctaattt 420
ctgatagacc taggacaatt tgaatgggca ttgaaattct tttggttgaa ttacgcaaac 480
aagcaaagga aaagtctcaa ttattattgg aaaatttggg gagagattat tatctcttga 540
tctcctagtn natt 554

<210> 566
<211> 631
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(631)

<223> n = A,T,C or G

<400> 566
ncgaagctgt gaanncattc acacggaatc tgganggtat tactgtaact tcttataata 60
cataatataa aagtttttga aagatataga cacaattaac ccctaaacaa cacactatct 120
gattctcaaa agcaatggct atttaacaag [illegible] [illegible] [illegible] 180
tttcacacac ctaaagatag catttagcag caagttagtc agacaaaaca aacataaata 240
tcttcacatt tcctatgttt gtttttaact ttacttcata aagccactga taattgaggt 300
ttctttcaag tataagattt ctaaaattaa aaactgtttt tgacatattt ttataaagaa 360
ataaaaagca aaacgcaatc caactattta tatgagtccc tcttctccaa cagctttaga 420
tgtttttctg agtacttttt acacagaata tttttattaa aatcagttct aattcattta 480
tgcagattag gggaaaatga ttcataataa attaacttta aaattacctt ctatctgctt 540
ctacctctat ccccccatca ccaccaaatc tgttgctaca gtgaactgta gccaatgtct 600
gtttgagggg gcccaaagca tctggtaatc t 631

<210> 567
<211> 510
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(510)
<223> n = A,T,C or G

<400> 567
cctatnatag cttctctagc tatcatactc caatcagcna aaaatgagaa aatgttgaga 60
aatagaagat aattcctcat ttaaggncac cttctanaat ttgtgcttaa nantctgttt 120
tcttctcatg ggccagcact tcggcaactg ggaaaaatta ngngtacagg gatctaggna 180
atactgttta tttgagcaat aatatattgn gctaacgttc aggcatccta ttactgagaa 240
ataagggaaa atgagtgtaa agtacaacta agagtctcgg ctacagggaa aaataccatc 300
agttaaatat ccatagtcct agagcattta tgtaaaactg caatttgaat cctgcaatac 360
attttggctt tttcctcagt gataccatgt gtgggaagtt gttctgtcaa ggtgggtcgg 420
ataatttgcc ctggaaagga cggatagtga ctttcctgac atgtaaaaca tttgatcctg 480
aagacacaag tcaagaaata ggcatggtgg 510

<210> 568
<211> 180
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(180)
<223> n = A,T,C or G

<400> 568
ttaatntgac ncacgcttat gcggaggaga atgntttcat gttacttata ctaacattag 60
ttcttctata gggtgataga ttggtccaat tgggtgtgag gagttcagtt atatgtttgg 120
gatttttag gtagtgggtg ttgagcttga acgctttctt aattggtggc tgcttttagg 180

<210> 569
<211> 237
<212> DNA
<213> Homo sapien

<400> 569
ccaattgatt tgatggtaag ggagggatcg ttgacctcgt ctgttatgta aaggatgcgt 60
agggatggga gggcgatgag gactaggatg atggcgggca ggatagttca gacggtttct 120
atttcctgag cgtctgagat gttagtatta gttagttttg ttgtgagtgt caggaaaagg 180
gcatacagga ctaggaagca gataaggaaa atgactatga gggcgtgatc atgaaag 237

<210> 570
<211> 352
<212> DNA
<213> Homo sapien

<400> 570
ctgtctctcc atttagagcc ccagttggtc ctgacctctt acaaatttgg tgttttcact 60
ttgatgttta tgaaccgatt gcattaaaaa tgcaggataa tgattcaggg ttagagaaac 120
tattatttat acaaatgtgg ttaacacctc atcattttaa attggctgtg ctaataatgc 180
tcattgtgct cttcagggtt atgtgtgtgt gtgtgtgtgt gttttgcctg aatctgcaac 240
ctacatttgc tctggcagta tgttgagtat atgctagaat agaatggacc taggcaactc 300
taaggtccta caactaaata cacttactta ggaaacctcc taaataagta gg 352

<210> 571
<211> 402
<212> DNA
<213> Homo sapien

<400> 571
ctgattttaa caataactac tgtgttcctg gcaatagtgt gttctgatta gaaatgacca 60
atattatact aagaaaagat acgactttat tttctggtag atagaaataa atagctatat 120
ccatgtactg tagtttttct tcaacatcaa tgttcattgt aatgttactg atcatgcatt 180
gttgaggtgg tctgaatgtt ctgacattaa cagttttcca tgaaaacgtt ttattgtgtt 240
tttaatttat ttattaagat ggattctcag atatttatat ttttatttta tttgtttcta 300
ccttgaggtc ttttgacatg tggaaagtga atttgaatga aaaatttaag cattgtttgc 360
ttattgttcc aagacattgt caataaaagc atttaagttg aa 402

<210> 572
<211> 70
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(70)
<223> n = A,T,C or G

<400> 572
tggatccgag ctcggtacca agcttggcgt aatcatggtc atagctgttt cctgtgntcg 60
ttttacaacg 70

<210> 573
<211> 423
<212> DNA
<213> Homo sapien

<400> 573
ccaatggttt cttagtgaaa gagtacacta gctctgaatg caatgccctc agaaagatat 60

cattcataga gacatacaaa gcacatggca acatgacatt ggaatacacg attctgagca 120
tcttcattca tgaccaacct ggctatagat ttcagatgtc ctcttggctc gaaggatatc 180
tgggatatcc atgctcactt gcattccttt ccctttaatt tcattttcta agtccttctt 240
gtattgtttc taaaagaaca gaaaataatc ttggagcttt gcttaagctt taatagcgat 300
gttgaaattt acatgtttga atctcaaagc cacccatgtg gaaagaaaac ttatgctctt 360
tccagctatg attcacggca tttattttaa actttgtatc [illegible] 420
tgg 423

<210> 574
<211> 129
<212> DNA
<213> Homo sapien

<400> 574
ctgttaaaag aacaaactta gcaatatata acagtttgct aacaggattt ttgactattc 60
actttgcgag ttatttttaa aaatccactt ttttactgag tcttactaca taccaggcac 120
tgtacttgg 129

<210> 575
<211> 684
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(684)
<223> n = A,T,C or G

<400> 575
ccagatntga cttttcaaaa ctactcacat tgtgaaaaan gcaggaacaa atctagtttc 60
aagttcagca tgccgttccc tgtttaattc ataaaacaca actggcagaa gtattacttg 120
aagcaaaaca aaagtaacgt gggaacttgc ttatttgcta agccacaatg tatttttcca 180
ggaatagcat aaatttgcca tctttcttgt gtctatggaa aaggggttta gaattgtttc 240
actaaaaatt aaatttctat attgtcaaac atgattgtat actcaaattt taaaatgtga 300
agggaacact tactaagcat ttcctgggta tgccactata ttaagtccta gtaatatgat 360
atagtttatt tcaatttttt ttcaactcat acttccttta aaatagcact gaccaaaaga 420
aagttaacat gagcttcatg tacaattttt aatctttttg cagaaaaata aactgagaaa 480
ggctaaaatt gttttattta agccactata ccaagacata ttgatttcac caatataaaa 540
attgagatag tttacatttt ttggtacatc tttaaaatct ggtatgtatt tttatactga 600
cagcacatct caatttggac aagctacatt tccagggctc aatagtcacc atgaatctca 660
attgtaatca aagaggttgg cctg 684

<210> 576
<211> 134
<212> DNA
<213> Homo sapien

<400> 576
ccttatttct cttgtccttt cgtacaggga ggaatttgaa gtagatagaa accgacctgg 60
attactccgg tctgaactca gatcacgtag gactttaatc gttgaacaaa cgaaccttta 120
atagcggctg cacc 134

<210> 577
<211> 133
<212> DNA

<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(133)
<223> n = A,T,C or G

<400> 577
ctgtctctcc attnagaagc cccantnggt cctnacctct tacaaatttg gtgttttcac 60
tttgatgttt atgaaccgat tgcattaaaa atgcaggata atgattcagg gttaganaaa 120
ctattattta tac 133

<210> 578
<211> 200
<212> DNA
<213> Homo sapien

<400> 578
cctcaaatct atcttcaaag gtgacccagc aatcagtgtc aatgccttta ctgtagttaa 60
cctggtaatt tcattcttta gtctctccaa gaaaatctga agtgtattag gcaagtcaga 120
acccaaattg tctccaaggt tgcaaataat ttgtcccata caggaaatag ccctttcctt 180
gacttcctga tcaatgtcag 200

<210> 579
<211> 402
<212> DNA
<213> Homo sapien

<400> 579
ctgattttaa caataactac tgtgttcctg gcaatagtgt gttctgatta gaaatgacca 60
atattatact aagaaaagat acgactttat tttctggtag atagaaataa atagctatat 120
ccatgtactg tagtttttct tcaacatcaa tgttcattgt aatgttactg atcatgcatt 180
gttgaggtgg tctgaatgtt ctgacattaa cagttttcca tgaaaacgtt ttattgtgtt 240
tttaatttat ttattaagat ggattctcag atatttatat ttttatttta tttgtttcta 300
ccttgaggtc ttttgacatg tggaaagtga atttgaatga aaaatttaag cattgtttgc 360
ttattgttcc aagacattgt caataaaagc atttaagttg aa 402

<210> 580
<211> 245
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(245)
<223> n = A,T,C or G

<400> 580
ccaattgatt tgatggtaag ggagggatcg ttgacctcgt ctgttatgta aaggatgcgt 60
agggatggga gggcgatgan gactaagatg atggcgggca ggatagttca gacngtttct 120
atttcctgag cgtctgagat gttagtatta gttagttttg ttgtgagtgt taggaaaagg 180
gcatacagga ctaggaagca gataaagaaa atgactntta gggcgtgatc atnaaanggg 240
ataaa 245

<210> 581

<211> 294
<212> DNA
<213> Homo sapien

<400> 581
tgcagcgcaa gtaggtctac aagacgctac [illegible] 60
tcatgatcac gccctcatag tcattttcct tatctgcttc ctagtcctgt atgccctttt 120
cctaacactc acaacaaaac taactaatac taacatctca gacgctcagg aaatagaaac 180
cgtctgaact atcctgcccg ccatcatcct agtcctcatc gccctcccat ccctacgcat 240
cctttacata acagacgagg tcaacgatcc ctcccttacc atcaaatcaa ttgg 294

<210> 582
<211> 230
<212> DNA
<213> Homo sapien

<400> 582
gaggtcgccc tcatagtcat tttccttatc tgcttcctag tcctgtatgc ccttttccta 60
acactcacaa caaaactaac taatactaac atctcagacg ctcaggaaat agaaaccgtc 120
tgaactatcc tgcccgccat catcctagtc ctcatcgccc tcccatccct acgcatcctt 180
tacataacag acgaggtcaa cgatccctcc cttaccatca aatcaattgg 230

<210> 583
<211> 481
<212> DNA
<213> Homo sapien

<400> 583
ccaagggtgt tctgcctgcc tcagcctccc aaagtgctgg gattacaggt gtgagccact 60
gtgcctgacc acaggaaaac ttatttaaat gagagatttg actcgaaaga tcccgttttt 120
ttaaggctct tagttcttaa aagcggcaca taatagaatt agtataatcc caaataaatt 180
ttcagtagat ttttggtgta acttgagaag atgattctgt cattttagt gacaatttaa 240
aagacctgaa attgtctaca gccatagaaa gtgaactact gatagttgtt tctgtaaagt 300
tttattggaa cacaaccaca cctatttgtt catctgtatt gtctttggtt actttgtgca 360
gagaccatgg cccacaaacc taaaacattc actttctagc tctttaagaa ataattggcc 420
cactgacacc ctggtcttaa ggtctagacc aattatttct caagagtatt agctgaatca 480
g 481

<210> 584
<211> 306
<212> DNA
<213> Homo sapien

<400> 584
ccaattaaga gctaaattta caaaataatc tctatcagga ggctttaagg tttaatgtct 60
ctaaagtccc tatggatata agaggcttga atgtactgaa ttcaaatttg gtttttaaat 120
gttataatag tttaggcccg agagccacat atttctgtct aagaatagaa agcatagcta 180
gctgcccaca cagaatattc atatagaggt gggggcaag aacaaaattt attcatttga 240
tacatagaaa tgggactact tagaatagac tcataataga aagcatcatc tggtttctca 300
tctcag 306

<210> 585
<211> 308
<212> DNA
<213> Homo sapien

<400> 585
ccagaatggt acagagtgga gggtgttctg ctaatgactt cagagaagta tttaagaaaa 60
acatagaaaa acgtgtgcgg agtttgccag aaatagatgg cttgagcaaa gagacggtgt 120
tgagctcatg gatagccaaa tatgatgcca tttacagagg tgaagaggac ttgtgcaaac 180
agccaaatag aatggcccta agtgcagtgt ctgaacttat tctgagcaag gaacaactct 240
atgaaatgtt tcagcagatt ctgggtatta aaaaactaga acaccagctc ctttataatg 300
catgtcag 308

<210> 586
<211> 416
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(416)
<223> n = A,T,C or G

<400> 586
cctgtctttg aatggatgaa ataggttaat aaaaaacatc actgtttaaa aactagaaca 60
ctgaaaaatt ctaggaaagc ttattttccc ttatattttt atggnacttt caacacttna 120
caacactatt tnaattaann tttnttctag agtttatann atatcagtac attcttttct 180
gtggatgcaa taatatagaa tcttattnca aatcttactg gcaggntctn ttaaattctt 240
caacggntgn catagtgatt aaccaaaatt agttatgatt tctgcctatc tgtgtgagaa 300
cttacagggg aaattgttct aaacctgagg aacatgaagt aactgtactg cacactccaa 360
atgatgacag tcattttata tcaccttcaa ttacccaaca gcttttaata gtctgg 416

<210> 587
<211> 382
<212> DNA
<213> Homo sapien

<400> 587
cctactatgg gtgttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga 60
gctgttcctc tttggactaa cagttaaatt tacaagggga tttagagggt tctgtgggca 120
aatttaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggt 180
ttgtcgcctc tacctataaa tcttcccact attttgctac atagacgggt gtgctctttt 240
agctgttctt aggtagctcg tctggtttcg gggtcttag ctttggctct ccttgcaaag 300
ttatttctag ttaattcatt atgcagaagg tataggggtt agtccttgct atattatgct 360
tggttataat ttttcatctt tc 382

<210> 588
<211> 307
<212> DNA
<213> Homo sapien

<400> 588
cctactcttc tccgtccatt gtactatctg cccgtggtgg ggatggcagt aggatcatat 60
ttgatgactt ccgagaagca tattattggc ttcgtcataa tactccagag gatgcgaagg 120
tcatgtcctg gtgggattat ggctatcaga ttacagctat ggcaaaccga acaattttag 180
tggacaataa cacatggact aatacccata tttctcgagt agggcaggca atggcgtcca 240
cagaggaaaa agcctatgag atcatgaggg agctcgatgt cagctatgtg ctggtcattt 300
ttggagg 307

<210> 589
<211> 89
<212> DNA
<213> Homo sapien

<400> 589
cctgggtgat tgaggatgca atgagctgtg attgtgccac cacactccag cctgggcaat 60
acagcaagac tgtctcaaaa aaaaaaaaa 89

<210> 590
<211> 456
<212> DNA
<213> Homo sapien

<400> 590
cctcagttct tgattgtggt tgacggggcg tcaccatgaa ggagcccatt tagtataaag 60
cttccaacct ttctcttaa tcgtttcttt aatcttttaa accatcttca agtgcatagg 120
ggagtttccg atgccagagg atgaaagcaa gtgctctctc caccctctcc tcccagagtg 180
aaaacaaatc ctttgctga tacttgtttc aaaagcatcc attgtaaagc ttctcagtga 240
cacaaaatac tgagaggtaa ctttttatca atcaaaccac atacccaat ttaacacctt 300
tcaatgctct gaattcaact gacagactaa agggtgtttc ctgtaacagt ctgaaatatt 360
aagtgttttt tttgttttgt ttttaaatct tatttcagaa aacttcctct tggggtagga 420
aagtacacat gaagcagcaa agtaacgaag aaaaac 456

<210> 591
<211> 289
<212> DNA
<213> Homo sapien

<400> 591
ccaattgatt tgatggtaag ggagggatcg ttgacctcgt ctgttatgta aaggatgcgt 60
agggatggga gggcgatgag gactaggatg atggcgggca ggatagttca gacggtttct 120
atttcctgag cgtctgagat gttagtatta gttagttttg ttgtgagtgt taggaaaagg 180
gcatacagga ctaggaagca gataaggaaa atgactatga gggcgtgatc atgaaaggtg 240
ataagctctt ctatgatagg ggaagtagcg tcttgtagac ctacttgcg 289

<210> 592
<211> 435
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(435)
<223> n = A,T,C or G

<400> 592
cgcgttagat gcgccttttc cggcctgtgc gtctgctctg gttcctctca ggcagcaaag 60
ctggggaagg aagctcaggc aggagcctcc ccgacaccac agcggcacaa gcagcagcta 120
aagcaccgca ctttgctctg ctaacctttt acttaaatga ggttttgcca aatccacatc 180
tggaaccgca tcacacccat ttgcaaggat gtttgttctt tgatgaaact gcatctctac 240
tgcacatgan ggctttcatt gtaggacaag aggagagttc gtttattttt gtaactgttt 300
tacatgttcc gattanttaa tcggnagctt atgtcatttg ctatgcctgt tgtcttctaa 360
tctctcctta ctaaaacatt acttcaaatt tnaattgacc cttgtttata atttatttaa 420
cgggatttgn gtgtc 435

<210> 593
<211> 633
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(633)
<223> n = A,T,C or G

<400> 593
ctgtttagtc agataattgt gtccgaattg attangaaaa taatagacca gccataaagc 60
agcataaaat attatgaaac tattccagaa gttcagtaat atctttggga cctgctcata 120
gcccaagttt tgtgaatact tttgtagtta aaaaaaattt ttactttacc agggcattgc 180
aattcttttc catcagtgaa tttcattcta cagacttttc agagcatctc ataatcagtc 240
aacaaatcta tttcaaatgt gtttgttact aagcaacggt tgctaagagc ttctgtaatt 300
aagatgaaag ttccaaggta acaatgccca aacacagcac cattttcacc attttctgat 360
aatgcaggag taggatggct aaaagtgaaa gaagaatcta ctctatggaa agcatggcac 420
ctgaaatttc tgaagatatt ggctgtcctc tagcttatat gagagagagt gtttgtgctt 480
tactaatcaa ccagtcattt ttttcttgtg tggctgaaat gtacattcca gacatgaaca 540
ggtagagtat gtgttggggg caggtttata ctgcatgggt gtgctgagac agggccacgt 600
ggtgatgtaa atgatgctgn ctgacacgtg cag 633

<210> 594
<211> 501
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(501)
<223> n = A,T,C or G

<400> 594
cctttacaag atgctggtac cttgatcttg gacngggcag gctccaagat ggaaagaaag 60
tgagcatctg ctttttaggg attatccagt ctatactact ctgttctagc cacacaaaac 120
aggttaagac agaaattggt accaagagtg gggtgttact acagcaaata cctgaaaatg 180
tagaagaggc tttgaaatgt ggtaattgga agaagctggt agaatttgga ggagtaggct 240
agaaaatgtc tgtattttca tgaatggagc attaagaata attccggtga ggccataggg 300
aaagtctaaa acttttcaga aattatgtaa gcgattgtga ttagtaggtt ggtagaaata 360
tagacagtaa aagcaattct gatgtggttt cagaggaaaa tgaaaaatat tagaaactga 420
aggaaggggc atccttgcta taaactggca aagaacttgg ctgaaatgtc tccatgtcca 480
agagatttat ggcagaaatg t 501

<210> 595
<211> 383
<212> DNA
<213> Homo sapien

<400> 595
ctggtcacca tcatcccttt aatcaactca cacctgttta aagagtgttt ctgatttgac 60
cttcatccct tagtttactg gcgttaaaaa aagtctcagc aattttcatt atttctcgtg 120
ggtctcatta tcaaaccttt acttatttcg gcatatttcc tctgggcttc ttctagtttc 180
tgccttacaa gcaatgctgt tctgtaaatt tattgaaacc tctggaacat ttcaccttta 240

gagatggagg atggaaggat tggtaccaga agagggctaa gatacgtttt ctgtcttgag 300
ctgaaagcac agtctactct ccttcgtttt gtcgatgaga aagttgaggc cagaggggag 360
gtgacatgtt tagagtcacc cag 383

<210> 596
<211> 266
<212> DNA
<213> Homo sapien

<400> 596
ccatggctag gtttatagat agttgggtgg ttggggtaaa tgagtgaggc aggagtccga 60
ggaggttagt tgtggcaata aaaatgatta aggatactag tataagagat caggttcgtc 120
ctttagtgtt gtgtatggct atcatttgtt ttgaggttag tttgattagt cattgttggg 180
tggtaattag tcggttgttg atgagatatt tggaggtggg gatcaataga gggggaaata 240
gaatgatcag tactgcggcg ggtagg 266

<210> 597
<211> 383
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(383)
<223> n = A,T,C or G

<400> 597
ctggtcacca tcatcccttt aatcaactca caccngttta aagagtgttt ctgatttgac 60
cttcatccct tagtttactg gcgttaaaaa aagtctcagc aattttcatt atttctcgtg 120
ggtctcatta tcaaaccttt acttatttcg gcatatttcc tctgggcttc ttctagtttc 180
tgccttacaa gcaatgctgt tctgtaaatt tattgaaacc tctggaacat ttcaccttta 240
gagatggagg atggaaggat tggtaccaga agagggctaa gatacgtttt ctgtcttgag 300
ctgaaagcac agtctactct ccttcgtttt gtcgatgaga aagttgaggc cagaggggag 360
gtgacatgtt tagagtcacc cag 383

<210> 598
<211> 266
<212> DNA
<213> Homo sapien

<400> 598
ccatggctag gtttatagat agttgggtgg ttggtgtaaa tgagtgaggc aggagtccga 60
ggaggttagt tgtggcaata aaaatgatta aggatactag tataagagat caggttcgtc 120
ctttagtgtt gtgtatggct atcatttgtt ttgaggttag tttgattagt cattgttggg 180
tggtaattag tcggttgttg atgagatatt tggaggtggg gatcaataga gggggaaata 240
gaatgatcag tactgcggcg ggtagg 266

<210> 599
<211> 294
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(294)

<223> n = A,T,C or G

<400> 599
ccaattgatt tgatggtaag ggagggatcg ttgaccacgt ctgttatgta aaggatgcgt 60
agggatggga gggcgatgag gactaggatg atggcgggca ggatagttca gacggtttct 120
atttcctgag cgtctgagat gttagtatta gttagttttg ttgtgagtgt taggaaaagg 180
gcatacagga ctaggaagca nataaggaaa atgactatga gggcgtgatc atgaaaggtg 240
ataagctctt ctatgatagg ggaagtagcg tcttgtagac ctacttgcgc tgca 294

<210> 600
<211> 213
<212> DNA
<213> Homo sapien

<400> 600
agatattggg ctgttaattg tcagttcagt gttttaatct gacgcaggct tatgcggagg 60
agaatgtttt catgttactt atactaacat tagttcttct atagggtgat agattggtcc 120
aattgggtgt gaggagttca gttatatgtt tgggattttt taggtagtgg gtgttgagct 180
tgaacgcttt cttaattggt ggctgccttt agg 213

<210> 601
<211> 471
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(471)
<223> n = A,T,C or G

<400> 601
ncctactatg ggtgttaaat tttttactct ctctacaagg ttttttccta gtgtccaaag 60
agctgttcct ctttggacta acagttaaat ttacaagggg atttagaggg ttctgtgggc 120
aaatttaaag ttgaactaag attctatctt ggacaaccag ctatcaccag gctcggtagg 180
tttgtcgcct ctacctataa atcttcccac tattttgcta catagacggg tgtgctcttt 240
tagctgttct taggtagctc gtctggtttc gggggtctta gctttggctc tccttgcaaa 300
gttatttcta gttaattcat tatgcagaag gtatagggggt tagtccttgc tatattatgc 360
ttggttataa tttttcatct ttcccttgcg gtactatatc tattgcgcca ggtttcaatt 420
tctatcgcct atactttatt tgggtaaatg gtttggctaa ggttgtctgg t 471

<210> 602
<211> 482
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(482)
<223> n = A,T,C or G

<400> 602
tgagcataca gcaataaaaa taacataatt tntatgtgta caatatttat ggaatacgtt 60
actggaacag ataaataatt tagttaataa catgacaaag aacagaaatt gtatacacta 120
tacagcatag taatagaata atgaatgatt aaagttatta atattaggta gaaaatgaag 180
ggtatctttg agagcagaac tcaaggaagc aagcaatttg ccttatgagg aaagagttac 240

ctgtggataa aggagaaact gaaaaattta caagtcaaga ctttttgagc aaaaacaaaa 300
atatgactat gagtcaccaa ttcagtacag tgaaaaaaaa gttgaagaga tatcttggaa 360
gtaaaccatg ttgtggaaga gcagggtttt gataatcatg ggattattct gaatgaattt 420
taaatgcgat aggaatatat gagataattt caccagagaa taatatgatc atgtttgcat 480
tt 482

<210> 603
<211> 372
<212> DNA
<213> Homo sapien

<400> 603
gttccaacct tcatttctga aactgttcta gagcactttg tctttctcgt agttcataac 60
ttaccccttc agtctagaat tagaattaca ttatctgttt tactacttta ctagactgta 120
agctcctaga agataaggac tagggagttc atctctgtat tccaccagaa ggtacagtga 180
ctcataacta gagtctttag atgaaactta ctgagttgaa taacttaata tatttctgtt 240
ttcattccca agggaggcca tgtctggaga tagaccttga atttaataaa ttttaggcac 300
tataccattt cagtggagaa aattgttggg aaatttgggg ggatggatat ataaggggga 360
ggaagtcact gg 372

<210> 604
<211> 468
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(468)
<223> n = A,T,C or G

<400> 604
gcngttttga gtgagtttct taatcctgag ttctggnttg attgcactgt ggtctgagag 60
atagtttgtt ataatttctg ttcttttaca cttactgagg agagctttac ttccaagtat 120
gtggtcgatt ttggaatagg tgtggtgtcg tgctgaaaag aatgtatatt ctgttgattt 180
ggggtggaga gttctgtana tgtctattag gtccgcttgg tgcagagttg agttcaattc 240
ctggatagcc ttgttaactt tctgtctcgt tgatctgtct aatgttgaca gtggggtggt 300
aaagtctccc attattattg tgtgggagtc taagtctctt tgtaggtcac taaggacttg 360
ctttatgaat ctgggtgctc ctgcattggg tgcacatata tttaggacag cnagctcttc 420
ttgttgaatt gatcccttta ccattatgta atggccttgn ctcttttg 468

<210> 605
<211> 288
<212> DNA
<213> Homo sapien

<400> 605
ccaattgatt tgatggtaag ggagggatcg ttgacctcgt ctgttatgta aaggatgcgt 60
agggatggga gggcgatgag gactaggatg atggcgggca ggatagttca gacggtttct 120
atttcctgag cgtctgagat gttagtatta gttagttttg ttgtgagtgt taggaaaagg 180
gcatacagga ctaggaagca gataaggaaa atgactatga gggcgtgatc atgaaaggtg 240
ataagctctt ctatgatagg ggaagtagcg tcttgtagac ctacttgc 288

<210> 606
<211> 572
<212> DNA

<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(572)
<223> n = A,T,C or G

<400> 606
gaatnaaatg aatgaaatag aaaatataat tgagagcttc aacaacagac tataccaaat 60
ggaggaaaaa atttctgaac ttgaagatag atcttttgaa ataacacaag cagtggcaaa 120
aatgaattaa aaagaataag gaaagcctaa aggatttatg agatatcatt aagcaagcaa 180
atattcatac tatgggcatt ccagatggaa aaaagaaggg taaaggtgag gaaatcatat 240
ttaatgaaat aatagcagaa aatttccgga gtcttgggag agagatgagc atttaggtcc 300
agggagctca aagaacccca aacagattca acccaaacag gtcctctctg gagcccaaca 360
tagtcaaatt gtaataagta aaagacaaag aattccaana agcattcaag agaaaagagt 420
caagtcataa ataagggaat ctccattagg ctaacagcag atatctcagc agaaagctta 480
cangccanga gagaatggga tgatatattc aaagtacttg aaagcagggg tnggggaaac 540
cctgctagct aaaaatatta taccccttgca aa 572

<210> 607
<211> 178
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(178)
<223> n = A,T,C or G

<400> 607
ctcggggtaa tctcccagca agaggtcagg tcctggntgt gcgtcccagg gtgtcagtga 60
aattggctgc tcccctgacc cagggcacct tcatgcgtct tcacagcagg actactgtga 120
ccaaggccag acctttcatc tttcaaaaga ctttgactaa aaatgcttta aaaaagca 178

<210> 608
<211> 416
<212> DNA
<213> Homo sapien

<400> 608
cctgtctttg aatggatgaa ataggttaat aaagaacatc actgtttaaa aactagaaca 60
ctgaaaaatt ctaggaaagc ttattttccc ttatattttt atggtacttt caacacttaa 120
taacactatt tcaattaagt tttctcctag agtttatagt atatcagtac attcctttct 180
gtggatgcaa taatatagaa tcttattcca aatcttactg gcaggttctc ttaaattctt 240
caacggctgt catagtgatt aaccaaaatt agttatgatt tctgcctatc tgtgtgagaa 300
cttacagggg aaattgttct aaacctgagg aacatgaagt aactgtactg cacactccaa 360
atgatgacag tcattttata tcaccttcaa ttacccaaca gcttttaata gtctgg 416

<210> 609
<211> 648
<212> DNA
<213> Homo sapien

<400> 609
ctgatctctc agcagaaact cttcaaacca gaagagagtg ggggccaata ttcaacattc 60

ttaaagaaaa taattttcaa cccagaattt catatccagc caaactaacc ttcacaagtg 120
aaggagaaat aaaatccttt acagacaagc aaatgctgag agattttatc accaccaggc 180
ctaccctaaa agagttcctg aaggaagcac taaacatgga aaggaacaac cagtaccatc 240
gaggctagga agaaaccgca tcaactaagg agcaaaataa ccagctaaca tcataatgac 300
aggatcagat tcacacataa cgatattaac tttaaatgta aatggactaa atgctccaat 360
taaaagacac agactggcaa attggataaa [illegible] [illegible] ggtgtattca 420
ggaaacccat ctcaccgtgc agagacacac ataggctcaa aataaagggc tggaggaaga 480
tctaccaagc aaatggaaaa caaaaaaagg caggggttgc aatcctagtc tctgataaaa 540
cagactttaa accaacaaag atcagaagag acaaagaagg ccattacata atggtaaagg 600
gatcaattca acaagaagag ctaactatcc taaatatata ttgcaccc 648

<210> 610
<211> 310
<212> DNA
<213> Homo sapien

<400> 610
ccagctcttc tctgtcacat tcctatttct gacttctgcc tggctttcag tttctgcccc 60
accttggctt tttcccagct tgaacctaat agaactccag agtttggggg gaggcccagc 120
cctttgtttt ctgctcttga agcatattca cacataaaaa gttgtattct cttacacaaa 180
ctgttttgag gctcttaccg tagtcgaagg tatcttagat cttccttagt gatctcatta 240
agaatatccg aaagtgtata accctcttca acaatctgaa acaaagatca gatccttaag 300
agctgagcag 310

<210> 611
<211> 254
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(254)
<223> n = A,T,C or G

<400> 611
ctgtttttac atctaaagca atagactaga actgaattnt cttctacata gtaaaatcac 60
aattgtggaa ttacaggaat tctggtgata ttaaggtgaa acaacaaaac acaaaaggcc 120
ctattttaac agttgatgtg acagtaagtt ttaatagaac ctgtaacttc attttggaaa 180
tgcttctcca ccaaataagg ccttttttccc ctatttaagg agccagatgg attgaaagat 240
gtggaaatag gcag 254

<210> 612
<211> 225
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(225)
<223> n = A,T,C or G

<400> 612
ctgactatat catgtcacca tcatagccaa tacaacattn ttgccatact tcctaaaaac 60
cttttcgcat acactgatca tgctacttat cagcactttc taacatcctg accaaacaga 120
cacccacacc tcttatagag tacactgtga gagaataaca tggacttgat atggcatcac 180

acttgtttta aagcaaaaaa aaaagaaaaa gaaaagaaaa aaaaa 225

<210> 613
<211> 471
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(471)
<223> n = A,T,C or G

<400> 613
ccatcagact tcttgggtgc ctggctatat tcaatgtgaa gtaaaaaata tcccaagtct 60
tacaccaaaa tagaggctct gacttagaag tatgctttta gctttctttt taaataagac 120
attctggaag aaaaaaaaag aaaaaggaaa gaaaatcaag tttgaaacac agttaacact 180
tattttggca agaaagcaac caaaatctaa aaagcataaa ctatgngtcc aaatgnaaaa 240
ggnattacag aacaaactgc aagaggggaa aattaaagcc ncactgaacg aaaaaataca 300
gtatgtctaa cattttggaa ttgnaattta aaccctaagg gcaaaagctg aaaaatcatg 360
cttanacctn ggncgngacc acnctaaggg cgaattccan cacactggcg gncgttacta 420
gtggatccna nctcggtacc aagcttggcg taatcctngg catagctgtt t 471

<210> 614
<211> 421
<212> DNA
<213> Homo sapien

<400> 614
gttatttttt agaatggctc tcccatcttg agtatgtgtg atgtttcctc atgtatgaat 60
gaagcatata catctttgtc agaagtatcc cagaagcaat tctgtactct cctcattatg 120
ttctattggg tgggccatgg tttttgattt gtctcattac tgatgatggt tacttttatt 180
atttgataaa ggttgtatat aacttatcta ttatggcata atacattagc taaaaccttg 240
gcggtgtaaa acagcagata cttacgtttc tcataggaat ggctctattg agtacctctg 300
tctcaaggct tctcaagagt ttgtagctac cttgttggct ggggttgcgg tctgacctaa 360
aggcttagtt agggggtggt agaaatcttc catatgttct ttgctacgtg gacctcacag 420
g 421

<210> 615
<211> 242
<212> DNA
<213> Homo sapien

<400> 615
cctcctattt attctagcca cctctagcct agccgtttac tcaatcctct gatcaggatg 60
agcatcaaac tcaaactacg ccctgatcgg cgcactgcga gcagtagccc aaacaatctc 120
atatgaagtc accctagcca tcattctact atcaacatta ctaataagtg gctcctttaa 180
cctctccacc cttatcacaa cacaagaaca cctctgatta ctcctgccat catgaccctt 240
gg 242

<210> 616
<211> 392
<212> DNA
<213> Homo sapien

<220>

<221> misc_feature
<222> (1)...(392)
<223> n = A,T,C or G

<400> 616
cctaatttgt agattgtgaa agcagctttc agtttaactt [illegible] [illegible] 60
taccatgttt tttttttnt tcctaaatct nttggttcag cttgngaatn ttacgtgccc 120
gtaaagtngg gatgttgaat nggcccttnt ttgttctggc agngagtcaa gngtccanca 180
tttttcata agngtttttt aaaatngttc tccancattt tatggctcct ccctcccatg 240
tcctcaaacc cagcaaaagc gtanaggcan aattanagga cccncccggg cggccgntaa 300
gggcnaattc cagcncactg gcggccgtta ctagnggatc cnagctcggn nccaagctng 360
gcgtaatcat ggncatagct gtttcctgtg an 392

<210> 617
<211> 215
<212> DNA
<213> Homo sapien

<400> 617
cctactatgg gtgttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga 60
gctgttcctc tttggactac cagttaaatt tacaagggga tttagagggt tctgtgggca 120
aatttaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggt 180
ttgtcgcctc tacctataaa tcttcccact atttt 215

<210> 618
<211> 433
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(433)
<223> n = A,T,C or G

<400> 618
cttttgtntg cctgttttgt ggactggctg gctctgttag aactctgtcc aaaaagtgca 60
tggaatataa cttgtaaagc ttcccacaat tgacaatata tatgcatgtg tttaaaccaa 120
atccagaaag cttaaacaat agagctgcat aatagtattt attaaagaat cacaactgta 180
aacatgagaa taacttaagg attctagttt agtttttgt aattgcaaat tatattttg 240
ctgctgatat attagaataa tttttaaatg tcatcttgaa atagaaatat gtattttaag 300
cactcacgca aaggtaaatg aacacgtttt aaatgtgtgt gttgctaatt ttttccataa 360
gaattgtaaa cattgaactg aacaaattac ccataatgga tttggttaat gacttatgag 420
caagctggtt tgg 433

<210> 619
<211> 259
<212> DNA
<213> Homo sapien

<400> 619
ctgcagtgtc cctttttata tcatgctagt gttgagacat acttgactaa cttgggaaca 60
gttcgatata ttgacaaccg tcaacttaag aaaatcaaca gcttttggcc ccagcgtcca 120
agtgaacttt tcatggagtg cagaatctca aatggacaaa atactttgtc tttttaaata 180
ctgaaaattt aattattagt actatgactg aaagattctt catggctaaa aagctctgca 240
tcaaactcaa ttcaggagg 259

<210> 620
<211> 393
<212> DNA
<213> Homo sapien

<400> 620
ccaccaaagc cacacggaga ttctgtcagg cgctgagaca ccacagcctt ttcaatctta 60
gggaaagaaa tcaagtcata taaattaata tcaacaggta aggtcattga gcaattgtct 120
ttcaactgtc taagacttta tcacttaaga tcataaacac agaagcaggt cataaaaata 180
gcttttctta aggtttagga gaatttgtag gggcacttac ttgataatct gaattttcta 240
gtcagaagtt taaataccac cttttaaaaa cataaaattt aatttgtaac aagttattaa 300
caaagcagta ttgtcgaaag ttttaagctt tctcccaata atttaattac attaattaaa 360
tttttaccat tctaatggtt acaaagtaac cag 393

<210> 621
<211> 563
<212> DNA
<213> Homo sapien

<400> 621
ctgacaatga taaaattatc tctatatggg caaacgcgtg ctctttgtcg aagaagaaag 60
cttcagcttc atgttccagg tgagttaatt aggcaatgta tgaatgctaa tatctctttc 120
acatatttg cttaagatct gtcttaggac tctcgtctgg cccatatggt tttccaaggg 180
cagaagggcc tctttttgat gagaggcagt tttcagtaac tcttaaagtg ataacagcaa 240
aggagaggag agagaagagt aagacaaatc gaaacattct tcaattgctt cttggccttt 300
tggctaagct caagctcaaa acaggtcttc aaggagaaaa tacatcacaa agaaaaggat 360
gttttatttc ttaccttgtc ctagaaaaat ttccataaac tctattggct taattctgta 420
aacttgacca atatcagagt gcttcctacc aaggagggta gctgatgagc gtgaccatgg 480
tacatcctag aagaatgtgt gatgaagaag ctttcaccgt gtaaaagagt tgaaaattat 540
tcaaggagac attatggtct tgg 563

<210> 622
<211> 505
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(505)
<223> n = A,T,C or G

<400> 622
tcttaagtgt gtttaataga taaagtaaac tttcctagtc aagggttaga tttttattat 60
ctcttgtgtt ccgactttct acttttcaac tttgaacttc aaaaaaacat tactttgctt 120
atccttttgta ctttgatcag gttgtttaga attgtagatc aaaccattct ttgatcattt 180
tattgtttaa atgnttagtt ccatttataa tttttatagc caactctcgg ttatttctgt 240
cttttgagat tgcaattcag aagctgtatg tcgaagtaat ttatgagttg acttttatac 300
ttaggcttct ttaaatacta atagtcaaga attctagagc atctaataaa aaattaactt 360
tcagatcatt gggaatctgt cctcatttaa atatgtgtaa atgcatttcc acagcaaatt 420
gcttcatgcc ctttgnctat aaggaaatta ttccttgtag ctaatacatt tttcattttg 480
cagnccaaat cttttttgag aaagg 505

<210> 623
<211> 489

<212> DNA
<213> Homo sapien

<400> 623
cctactatgg gtgttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga 60
gctgttcctc tttggactaa cagttaaatt tacaagggga [illegible] [illegible] 120
aatttaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggt 180
ttgtcgcctc tacctataaa tcttcccact attttgctac atagacgggt gtgctctttt 240
agctgttctt aggtagctcg tctggtttcg gggtcttag ctttggctct ccttgcaaag 300
ttatttctag ttaattcatt atgcagaagg tataggggtt agtccttgct atattatgct 360
tggttataat ttttcatctt tcccttgcgg tactatatct attgcgccag gtttcaattt 420
ctatcgctat actttatttg ggtaaatggt ttggctaagg ttgtctggta gtaaggtgga 480
gtgggtttg 489

<210> 624
<211> 233
<212> DNA
<213> Homo sapien

<400> 624
gttggggaac agctaaatag gttgttgttg atttggttaa aaaatagtag ggggatgatg 60
ctaataatta ggctgtgggt ggttgtgttg attcaaatta tgtgtttttt ggagagtcat 120
gtcagtggta gtaatataat tgttgggacg attagtttta gcattggagt aggtttaggt 180
tatgtacgta gtctaggcca tatgtgttgg agattgagac tagtagggct agg 233

<210> 625
<211> 459
<212> DNA
<213> Homo sapien

<400> 625
ttcgagaaca tttttaataa ataatgtgac aaaattactt ttctgattat tggattttca 60
gtatgcaaaa ttatggctaa aaataagggg cttcttacat gaacataatg aaaacattaa 120
tcacatggat tgttccctta gtactgcacg ccttttctat ggaacttttt caaattatct 180
aaatgaacaa gtttggtttt ggtgaacacc agcctttttt tttgtggttc agttttgttt 240
ggctttgtct tccactgggg tcagacctga tacttatcta tctatgaata aatgtacatt 300
tttttcttca aatagcacca attataaaat caatgatatt cataaaatga caaaaaagga 360
tcatagaaat ctactagtca gagggcatca tttgtcaatt gaaagcaagt aatgcctcta 420
ttagagattt taaggaaatc ttgtaggttt cgacattgg 459

<210> 626
<211> 458
<212> DNA
<213> Homo sapien

<400> 626
cctgatgatt gttttaaaca gtagaaaggg ttcagctaag aactacagtc cactctcagc 60
cctgtcatgt actataggac aagtcttcat tcacaacaaa tggatagcaa caccaatctc 120
gtaacactgg gaaaactgca tacaatattt agaaggaaca ctaatacagc agaatctgca 180
cacaacggag tcaaagatct gaggccaaat cctactacac tttacgactt tgagttggtc 240
acttttctga accttagctt ctccatcagt gtaaaactga tgtaaaataa tataaagcta 300
tatgaaagct gatgtgattt acttgtgaaa tagtatgtgc aaaaggactt tgtaaaatgt 360
aaagcactat gctggttatt gtgatatctg agatattttt aaagttgcaa ttcaattcaa 420
caagcattca tttagagtca tgtgcaaggc actgtgct 458

<210> 627
<211> 393
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(393)
<223> n = A,T,C or G

<400> 627
ccatnngaac gcactcagga ggtggtttgt tctggatgca gaaaccagag atctagtttc 60
tatccacaca gacgggaatg aacagctctc tgtgatgcgc tactcaatag atggtacctt 120
cctggctgta ggatctcatg acaactttat ttacctctat gtagtctctg aaaatggaag 180
aaaatatagc agatatggaa ggtgcactgg acattccagc tacatcacac accttgactg 240
gtccccagac aacaagtata taatgtctaa ctcgggagac tatgaaatat tgtactggga 300
cattccaaat ggctgcaaac taatcaggaa tcgatcggat tgtaaggaca tttgattgga 360
ccgacatata cctgtgggct aggacttcca gga 393

<210> 628
<211> 233
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(233)
<223> n = A,T,C or G

<400> 628
ctggatttat aaaatagttg aatgacaaaa gaagnntgtt ttgacagtaa aaaaaagaca 60
ttatggacaa aatatgcaaa atgtgcaaag aaaaaataaa tttgcattag aaaggtgggc 120
atttgatctc tgagccctgt gccatgtaac attgccatgt tctttcactg ttgtttgaat 180
gttgtacccc ancccttgac tctggactta aggcaagcta tgactggctt tgg 233

<210> 629
<211> 450
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(450)
<223> n = A,T,C or G

<400> 629
ccnggacaat ntaggcagga gaaggaaata aagggtattc aattaggaaa agaggaagtc 60
aaattgtccc tgtttgcaga tgacatgatt gtatatctag aaaaccccat tgcctcagcc 120
caaaatctcc ttaagctgat aagcaactcc agcaaagtcg caggatacaa aatcaatgga 180
cacaaatcac aaacattctt atacaccaat aacagacaaa cagaggccaa atcacgagtn 240
gaactctatt ccaattgctt tcaagaaaat taaaatacct agggatccaa cttacaaggg 300
acatgaagga cctcttcaag gagaaactac aaaccactgc tcaatgaaat aaaagaggat 360
acaaagaaat ggaagaacat tccatgctca ttggtagctt gatggggatg gcattgaatc 420
tataaattac cttgggcagt atggacctca 450

<210> 630
<211> 486
<212> DNA
<213> Homo sapien

<400> 630
cctactatgg gtgttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga 60
gctgttcctc tttggactaa cagttaaatt tacaagggga tttagagggt tctgtgggca 120
aatttaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggt 180
ttgtcgcctc tacctataaa tcttcccact attttgctac atagacgggt gtgctctttt 240
agctgttctt aggtagctcg tctggtttcg gggtcttag ctttggctct ccttgcaaag 300
ttatttctag ttaattcatt atgcagaagg tatagggtt agtccttgct atattatgct 360
tggttataat ttttcatctt tcccttgcgg tactatatct attgcgccag gtttcaattt 420
ctatcgccta tactttattt gggtaaatgg tttggctaag gttgtctggt agtaaggtgg 480
agtggg 486

<210> 631
<211> 211
<212> DNA
<213> Homo sapien

<400> 631
tttacataaa tattatacta gcatttacca tctcacttct aggaatacta gtatatcgct 60
cacacctcat atcctcccta ctatgcctag aaggaataat actatcactg ttcattatag 120
ctactctcat aaccctcaac acccactccc tcttagccaa tattgtgcct attgccatac 180
tagtctttgc cgcctgcgat gcagcggtag g 211

<210> 632
<211> 293
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(293)
<223> n = A,T,C or G

<400> 632
cagcgcaagt aggtctacaa gacgctactt cccctatcat agaagagctt atcacctttc 60
atgatcacgc cctcatagtc atttttcctt atctgcttcc tagtcctgta tgccctttc 120
ctaacactca caacaaaact aactaatact aacatctcag acgctcagga aatagaaacc 180
gtctgaacta ngctgcccgc catcatccta gtcctcatcg ccctcccatc cctacgcatc 240
ctttacataa cagacgaggt cnacgatccc tcccttacca tcaaatcaat tgg 293

<210> 633
<211> 263
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(263)
<223> n = A,T,C or G

<400> 633

nggtctgcag tgtccctttt tatatcatgc tagtgttgag acatacttga ctaacttggg 60
aacagttcga tatattgaca accgtcaact taagaaaatc aacagctttt ggccccagcg 120
tccaagtgaa cttttcatgg agtgcagaat ctcaaatgga caaaatactt tgtcttttta 180
aatactgaaa attnaattat tagtactatg actgaaagat tcttcatggc taaaaagctc 240
tgcatcaaac tcaattcagg agg 263

<210> 634
<211> 491
<212> DNA
<213> Homo sapien

<400> 634
cctactatgg gtgttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga 60
gctgttcctc tttggactaa cagttaaatt tgcaagggga tttagagggt tctgtgggca 120
aatttaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggt 180
ttgtcgcctc tacctataaa tcttcccact attttgctac atagacgggt gtgctctttt 240
agctgttctt aggtagctcg tctggtttcg gggtcttag ctttggctct ccttgcaaag 300
ttatttctag ttaattcatt atgcagaagg tataggggtt agtccttgct atattatgct 360
tggttataat ttttcatctt tcccttgcgg tactatatct attgcgccag gtttcaattt 420
ctatcgccta tactttattt gggtaaatgg tttggctaag gttgtctggt agtaaggtgg 480
agtgggtttg g 491

<210> 635
<211> 270
<212> DNA
<213> Homo sapien

<400> 635
ccaattgatt tgatggtaag ggagggatcg ttgacctcgt ctgttatgta aaggatgcgt 60
agggatggga gggcgatgag gactaggatg atggcgggca ggatagttca gacggtttct 120
atttcctgag cgtctgagat gttagtatta gttagttttg ttgtgagtgt taggaaaagg 180
gcatacagga ctaggaagca gataaggaaa atgactatga gggcgtgatc atgaaaggtg 240
ataagctctt ctatgatagg ggaagtagcg 270

<210> 636
<211> 383
<212> DNA
<213> Homo sapien

<400> 636
cctactatgg gtgttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga 60
gctgttcctc tttggactaa cagttaaatt tacaagggga tttagagggt tctgtgggca 120
aatttaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggt 180
ttgtcgcctc tacctataaa tcttcccact attttgctac atagacgggt gtgctctttt 240
agctgttctt aggtagctcg tctggtttcg gggtcttag ctttggctct ccttgcaaag 300
ttatttctag ttaattcatt atgcagaagg tataggggtt agtccttgct atattatgct 360
tggttataat ttttcatctt tcc 383

<210> 637
<211> 537
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature

<222> (1)...(537)
<223> n = A,T,C or G

<400> 637
ttttaatcct ggggtatata ggcagnactt taaattgcaa agtcttccgg gcctattttc 60
ctctacattt ttgtaattaa ctcctggggc ttacttgctt tggcagtact [illegible] 120
gagctggttc ttctttttctc ccaattattt tcatatgaaa gcacctacaa ttagcctgtt 180
agtcctattc agatacatca aatatcagtg aatgctttac tattcgcaca tttaagcatc 240
tttgttttac ataaaattag agtatgaaaa ccagtgttca attttttatc ttgttgagct 300
tgtaaaatgc cagcaattta aaactaggac ttttcccccc ataagccaag gaggtagaat 360
tactaataca agggttaaag aaggtagatt ttgttttcaa tatttgggta atattagaaa 420
gattcttccc acagggaaga actagcaagt gtcccaattt tttccaaacg ttggggaggg 480
gaaaattcac tgtatcatga aaccctaagg gtttgngtgc acttcctgct ttttagg 537

<210> 638
<211> 445
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(445)
<223> n = A,T,C or G

<400> 638
ccagcagaac acagnagtga tttggtcccg tttgttcccc agtggggtat ctatccttgt 60
gcagggcaca agcctacatg gtggctctgg tcatatcatt agaaaataga cagaaatggg 120
ctgcacacca gaatgaatga attgaattga aagggaggag tgatggtgga aaaaaaaaca 180
agtcaattca tttagactgg tagaaccaga accactgtgt agtacatcca aacggttaaa 240
attccctgga agatgttaca taatcctatc atggtgttta tttatggaaa tctattttaa 300
aaattttatg taatactgca cagtctgttt gcatgatgcc ttgtacgtag tagcaactca 360
gtaaatactt tttgaatgaa ctagtatagt attttaatta gctagtcttc gtgtactggt 420
acaaaagaac agtgtcatct tacag 445

<210> 639
<211> 584
<212> DNA
<213> Homo sapien

<400> 639
gcttgagtat tctatagtgt cacctaaata gcttggcgta atcatggtca tagctgtttc 60
ctgtgtgaaa ttgttatccg ctcacaattc cacacaacat acgagccgga agcataaagt 120
gtaaagcctg gggtgcctaa tgagtgagct aactcacatt aattgcgttg cgctcactgc 180
ccgctttcca gtcgggaaac ctgtcgtgcc agctgcatta atgaatcggc caacgcgcgg 240
ggagaggcgg tttgcgtatt gggcgctctt ccgcttcctc gctcactgac tcgctgcgct 300
cggtcgttcg gctgcggcga gcggtatcag ctcactcaaa ggcggtaata cggttatcca 360
cagaatcagg ggataacgca ggaaagaaca tgtgagcaaa aggccagcaa aaggccagga 420
accgtaaaaa ggccgcgttg ctggcgtttt tccataggct ccgcccccct gacgagcatc 480
acaaaaatcg acgctcaagt caagaggtgg cgaaacccga caggactata aagataccag 540
gcgtttcccc ctggaagctc cctcgtgcgc tctcctgttc cgac 584

<210> 640
<211> 404
<212> DNA
<213> Homo sapien

<400> 640
ccataggaac gcactcaggc aggtggtttg ttctggatgc agaaaccaga gatctagttt 60
ctatccacac agacgggaat gaacagctct ctgtgatgcg ctactcaata gatggtacct 120
tcctggctgt aggatctcat gacaacttta tttacctcta tgtagtctct gaaaatggaa 180
gaaaatatag gagatatgga aggtgcactg gacattccag ctacatcaca caccttgact 240
ggtccccaga caacaagtat ataatgtcta actcgggaga ctatgaaata ttgtactggg 300
acattccaaa tggctgcaaa ctaatcagga atcgatcgga ttgtaaggac attgattgga 360
cgacatatac ctgtgtgcta ggatttcaag tatttggtgt ctgg 404

<210> 641
<211> 138
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(138)
<223> n = A,T,C or G

<400> 641
ctgtgacagg aacattacct gaagtgcagg gtggttacct gcacaaagtc ccatttccaa 60
aaatttctgt gtaattcacc agaaattttg gatggaataa ttagaaaaaa aaaaagaggt 120
taaaacntgt aactcaaa 138

<210> 642
<211> 381
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(381)
<223> n = A,T,C or G

<400> 642
ctgtaggtgg aatttttacc cagaaaagat aggccctaga agcctcattt cttttctcca 60
tggaaaagga cagccctctg ctgcagcgtt caacttgtgt gtttactgac agagtgaact 120
acagaaatag cttttcttcc taaaggggat tgttctacat tttgaagtta ttttttaata 180
aaattgaatt atgttgtgta ttgtgcttcc taataggaaa tgcattattg gactgttttt 240
gtaacatcct gtttattgca aatagctagt atcgttcaaa aactgtataa aatacttttg 300
tacatattag caatgtctaa tttgtataca cttcagttaa atttccctaa aacttgaaag 360
gggaccttgt anaaattaaa a 381

<210> 643
<211> 403
<212> DNA
<213> Homo sapien

<400> 643
ccttcctaaa aaatagtggt gagctggagg ctacttccgc cttcttagcg tctggtcaga 60
gagctgatgg atatcccatt tggtcccgac aagatgacat agatttgcaa aaagatgatg 120
aggataccag agaggcattg gtcaaaaaat ttggtgctca gaatgtagct cggaggattg 180
aatttcgaaa gaaataattg gcaagataat gagaaaagaa aaaagtcatg gtaggtgagg 240
tggttaaaaa aaattgtgac caatgaactt tagagagttc ttgcattgga actggcactt 300

atttctgac catcgctgct gttgctctgt gagtcctaga tttttgtagc caagcagagt 360
tgtagagggg gataaaaaga aaagaaattg gatgtattta cag 403

<210> 644
<211> 688
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(688)
<223> n = A,T,C or G

<400> 644
cctatttatt tgttttggcc ctggatcttt cctaatcaca attatatttc tttatttttg 60
cctttgagca gtttcattta tctttgtggg cagggaagat taaatatgaa attcagtcca 120
gtcattttgc tactggttag ctttagtttg aggcaagtaa aaatttttga ttaaaattag 180
tttcttaaaa ttatgccctt gctttaccaa ataatcaaat tggctaaaaa ataagggtat 240
gtaactttgc attttgaaga acaaaccaat aatttttcat gagccctact cgatcttctt 300
taaagaagac cttcctaaga gacaattagg gatgagtttg attaatggga aatagctcta 360
ggttagatta ttttaaattc catacaccaa gtgatttaac cacagtggca gtggcagctt 420
ctgaaccgtc aagtatgaac atcacttaaa aattaaaaga tgcttaataa taaactctta 480
attttcatta agccaatctg taattcagaa gaaaagcata tgtctgccat gggactattg 540
cagtgcgtct ccatcagtgt taacacagga gagatatgtt attttatgtg tatgtcttag 600
tttgggatat gtggtagtaa gaacatgtca agagtgcttt tcttcaaacc tgncagctca 660
actgangaaa gacaggtact tccattgc 688

<210> 645
<211> 484
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(484)
<223> n = A,T,C or G

<400> 645
ccaaatgtgt ctccagccca cacttccagg tggcagagcg agctctctat tactggaata 60
atgaatacat catgagttta atcagtgaca acgcagcgaa gattctgccc atcatgtttc 120
cttccttgta ccgcaactca aagacccatt ggaacaagac aatacatggc ttgatataca 180
acgccctgaa gctcttcatg gagatgaacc aaaagctatt tgatgactgt acacaacagt 240
tcaaagcaga gaaactaaaa gagaagctaa aaatgaaaga acgggaagaa gcatgggtta 300
aaatagaaaa tctagccaaa gccaatcccc aggtactaaa aaagagaata acatgaaaac 360
gcccagggtt acttgaatgt ttttataaga taggaatata tgtcttcacc atgggggggg 420
gtctcggatt tcactaacgt tgtatatgaa aatgggtgcn ataaaaagta cttttaaact 480
ttgt 484

<210> 646
<211> 447
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature

<222> (1)...(447)
<223> n = A,T,C or G

<400> 646
gggtcgcgtt gaacaacttg gttcaagatg gtgggggcat ttttagagcg gcaataattg 60
aaaaaaaagg cgaactctgc cttggagagg tagatgataa gaaataaaaa ggtgtttata 120
actattttgt attataaagt gggccttaga gataggaaga agaatgatgg attccttttg 180
gatcaatcag aaaggaaaca cgaaagaaaa gtcaggaagg tagagagaga aaaagggagg 240
gaaggagaaa gaatgggaat aaaataagga ggtaagagat actattttg ctgagcaacc 300
agtgtgtttc aggatgatac aaagaaaaat atagaataga aataagtgca ggcttggaat 360
cagctacaaa tcctaaagat ggggtgtgtg tggatgtgtg tgtgtgtgtg tgnacaccat 420
tgtgtgtttg taaaatgtgt atgtccc 447

<210> 647
<211> 388
<212> DNA
<213> Homo sapien

<400> 647
gaaggtgata taaaatgact gtcatcattt ggagtgtgca gtacagttac ttcatgttcc 60
tcaggtttag aacaatttcc cctgcaagtt ctcacacaga taggcagaaa tcataactaa 120
ttttggttaa tcactatggc agccgttgaa gaatttaaga gaacctgcca gtaagatttg 180
gaataagatt ctatattatt gcatccacag aaaagaatgt actgatatac tataaactct 240
aggagaaaac ttaattgaaa tagtgttatt aagtgttgaa agtaccataa aaatataagg 300
gaaaataagc tttcctagaa tttttcagtg ttctagtttt taaacagtga tgttttttat 360
taacctattt catccattca aagacagg 388

<210> 648
<211> 632
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(632)
<223> n = A,T,C or G

<400> 648
cctggctggg cntttgacct gcgnttttaa atnactcaca gagggtggga caggaggaag 60
agtgaaggaa aaggtcaaac ctgttttaag ggcaacctgc ctttgttctg aattggtctt 120
aagaacatta ccagctccag gtttaaattg ttcagtttca tgcagttcca atagctgatc 180
attgttgaga tgaggacaaa atcctttgtc ctcactagtt tgctttacat ttttgaaaag 240
tattattttt gtccaagtgc ttatcaacta aaccttgtgt taggtaagaa tggaatttat 300
taagtgaatc agtgtgaccc ttcttgtcat aagattatct taaagctgaa gccaaaatat 360
gcttcaaaag aagaggactt tattgttcat tgtagttcat acattcaaag catctgaact 420
gtagtttcta tagcaagcca attacatcca taagtggaga aggaaataga tagatgtcaa 480
agnatgattg gtggagggag caaggttgaa gataatctgg ggttgaaatt ttctagttnt 540
cattccgtac atttttagtt agacatcaga tttgaaatat taatgttacc tcctcaatgg 600
ggtggtatca gacctgcccg ggcggncgnn tc 632

<210> 649
<211> 300
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(300)
<223> n = A,T,C or G

<400> 649
nggtgaagat agaanaaata taagcgaaat tggataaaat agcactgaaa aaatgaggaa 60
attattggta accaatttat tttaaaagcc catcaattta atttctggtg gtgcagaagt 120
tagaaggtaa agcttgagaa gatgagggtg tttacgtaga ccagaaccaa tttagaagaa 180
tacttgaagc tagaagggga agttggttaa aaatcacatc aaaaagctac taaaaggact 240
ggtgtaattt aaaaaaaact aaggcagaag gctttggaag agttagaaga atttggaagg 300

<210> 650
<211> 498
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(498)
<223> n = A,T,C or G

<400> 650
ngtnctgnta aacagaaggg tacaangccc ttctggcttt aagcagtcat aggaatgtga 60
cagacattcc tcttagggag cgcctcctcc tagggtttcc tcatctgtct cacactgagt 120
ggatgtaatg ctattttaat cctgctgtgg cccccaatac tagtacttgt ccataccttc 180
ttgcattttt agcgtctgct ctgtggggtt gttaggccct ggcactccca ggaactagtg 240
ctaaagctgc atctntctct cccctctagg gatcgataaa gtttcactgc agaaagtctc 300
cactgcggta tgctgacatc tgccctgaac cttcacccta cagcattaca ggctttaatc 360
agattctgct ggaaagacac aggctgatcc acgtgacctc ttctgccttc actgggctgg 420
ggtgatcctt ggtgcctttg tttccacaag gccttttcct gccccctgcc ttgccaaaga 480
catttaatca gcacacag 498

<210> 651
<211> 654
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(654)
<223> n = A,T,C or G

<400> 651
ctgagggtcc ccaggtttct aaagctctca ggacgagaaa gtaggtccca agataaggag 60
cctaaagggc ttttttcttt ctgtgtattc cttcttggcc tccaacatgg gtacagtcac 120
aagagcatgt aacagagaag aaggactana cctaccattt tctggataaa gaattggaaa 180
gaggatccac aggtaaccaa aaagtaccag ggaaatggca gagaaggaaa acctcaggag 240
accaacctca taagtggtat ttattagngc ctgggctcaa atccaaattg tacatgaata 300
tgtctggtcc tagatagggt accgaagact ttgaaagtga attttggtat atcattgccc 360
agattccaga ctggntattg tgtgacacaa catacaggat atatctgaat agtgctcaga 420
agagtttgaa aatgcaaatg atattaaaat aaagatgaaa aagagaaagc tggtcagaac 480
ttgtggacat aaccccttctg gatctgtngc ctgattaaaa aatagttgat attctcgaat 540
gaattaaaac aagatttaga gactgagcat ggtagctnat tcttgtaatc caacnctttg 600
ggagggcaag gcaanagaat tgcttgcggc caggagtttt gagaccagct tggg 654

agctatcata aaattcactt tcctgaagac atttactctc attcacttcc aaactccaaa 180
cctttttctg gtagcaccac ttttgttttt aatagaaaga tgagttcata tctgtacatc 240
tctccaaagc tctaaggaat gagaaaagga tcctagtata ttgaaattac tgatgtttaa 300
tacctctgcc ttttcactaa aagccattta atatttttaa agtcaaaact tgacatacag 360
gtatttataa ggaatctcca tgactctgaa ggaatgaaat tgatgtaggt agctttggct 420
atgtaaagac atagtagagg acaattactt aaagaagagt tttcttttga ggatttgtag 480
atttgactaa gcag 494

<210> 656
<211> 477
<212> DNA
<213> Homo sapien

<400> 656
cgcgttactg tacatattgc tagcaggaga caactggaaa tactaaacaa atactggaat 60
tcacattaca gacagacgaa accaacatgg atgccacaca taacttcctt tgtagtttca 120
cagagggcct atttgtggtt gctcaggtgg ggtcatacat tgcttgcaga aatggcctga 180
tcatagctct atgaaacaat gaattcggaa tgaaatctta ccatgacacc tctctgtagg 240
aaagaaatgt tgcttcacgt gtgctaagtt gagataataa tatttcacat atttatatac 300
agagaatcac tctcaaattt aacccaagat aagcaatagg atttgggggt gacttgtaca 360
catttctaac aacacttttc tttttctag aggtcactct caaacactga tatatcacta 420
tagtttgagt gtagggattc agtaatcaaa ggttgttatt gcaaaagagc caggcag 477

<210> 657
<211> 576
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(576)
<223> n = A,T,C or G

<400> 657
cctctacctg tanatcacta tttttctaaa gacaatttgg tgttttgaag ataaatgtca 60
ttagtctatg ataatagcat cataggacaa ttagccattt tagacttgac catattttct 120
ctttttagca tatagccatc ttgatattta ggtgggagac tactccaatg gagcaacagt 180
ttcattttac atgattggat ttagaaattt acaaatttta aactcataag aattctaaat 240
aatttgaaaa tggaaacatt tgacccacag tctagcagca taaatacatt tataaaatac 300
ttcattgttg atcttaggtc attgatttaa aacagaattt ggtgactatg ggcaggtgga 360
gggggccagt gaggaaggta taaaagagaa atctttatga attgtgttca gattgatttt 420
gtataaacat aatatattca tggttgtatc tcttatttat aatacccaac taacatgaag 480
gtggtccaag ggaaggatca atattttaaa taacatattt gcttaaaata tcatacagtg 540
gctgcttcat aaaaaatctt ataaactttt attacc 576

<210> 658
<211> 344
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(344)
<223> n = A,T,C or G

<210> 652
<211> 293
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(293)
<223> n = A,T,C or G

<400> 652
ngtctgttgc actgaggtga ctaaggatac attttgagga agtagctcca agaacatttc 60
cattttcact gtgccttcac atacatctaa tggaaatgaa cagcacccttt catccatcca 120
cggaagcgat taagaaaagg gtgggatgga aaaattaacc caacaatatt agatcaatac 180
gtagtattta agngtccata atgtgccagg ctgaagatgc acgggaaaac cacactagcc 240
ggtctgtcaa gggcttgaga ataccataaa caagaaaaca gacgaaccaa ttt 293

<210> 653
<211> 294
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(294)
<223> n = A,T,C or G

<400> 653
ngtccaccac tgcagcccta catacagttg aaaaaaaatt ccattctgtt aacatttgtt 60
ttataagttt tcacgcaata cacaaaaaac ccctctgcac ttcttgtaaa gaacaaaaaa 120
gatacacaac agttaagcgt aaagatcaca ggcaatagca ttcaaacatg gatgtgggta 180
gagaaaggag tacctggcat gagtacctgc ttagtttgac tgaatccttg atttttaatt 240
tggcttttca tgggccgctc acaacaccaa cgctgtgtga ggtatggtag tcag 294

<210> 654
<211> 250
<212> DNA
<213> Homo sapien

<400> 654
ctgtccttga acaagtatca atgtgtttat gaaaggaaga tctaaatcag acaggagttg 60
gtctacatag tagtaatcca ttgttggaat ggaacccttg ctatagtagt gacaaagtga 120
aaggaaattt aggaggcata ggccatttca ggcagcataa gtaatctcct gtcctttggc 180
agaagctcct ttagattggg atagattcca aataaagaat ctagaaatag gagaagattt 240
aattatgagg 250

<210> 655
<211> 494
<212> DNA
<213> Homo sapien

<400> 655
ccattataat tttataacac cattacccctt taaattctac cgattataag cagcgtaaaa 60
gtaactatat aaagcaaaca tcgcaaagga actctgcagg agctcttaat tcctttatgt 120

<400> 658
cctgaaaaga aagntgctct tatggactct tgcatgttaa gactatgtct tcacatcatg 60
gtgcaaatca catgtaccca atgactccgg ctttgacaca acaccttacc atcatcatgc 120
catgatggct tccacaaagc attaaacctg gtaaccagag attactggtg gctccagcgt 180
tgttagatgt tcatgaaatg tgaccacctc tcaatcacct ttgagggcta aagagtagca 240
catcaaaagg actccaaaat cccataccca actcttaaga gatttgtcct ggtacttcag 300
aaagaatttt catgagtgtt cttaattggc tggaaaagca ccag 344

<210> 659
<211> 230
<212> DNA
<213> Homo sapien

<400> 659
ctgctttccc tgctaaacag ttccagagca aaagcagcaa aaagaaaata tgggagggat 60
atgggcaacg tatactcgaa cgtacgcaga gaagagagta cggttagctc taatatttct 120
cattgaactt ggtggtatgt gccttccctg catataaggc catagtgctt ttttgggagc 180
gctagaatat ccatccactt gacagtgacc acaaaatagg ctgtttccag 230

<210> 660
<211> 80
<212> DNA
<213> Homo sapien

<400> 660
ctggtccntg ttaaactcga tcaccacttt ggagagatcg actggaggct cctgggtgtt 60
ctgaggggcc tgggggacag 80

<210> 661
<211> 535
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(535)
<223> n = A,T,C or G

<400> 661
ctgaaccata tctgattaac tctttggtct ctgttattgg aacaaaaccg acgctatgcc 60
tgcagccgcc agactgcaac caaaaacaca gtttggggtc agaagacatt aaaaatcaca 120
ataaaatagg atgaatgttc taagtcacgc aactgaatca aggcaccttt ttttttcaaa 180
agcaaaaagt tgtttaacaa tattccagaa tagtagatac ttcaaaaacc agattacagt 240
atatatcatt ttgctgcaca ttttagtcta ttttctgtat acatagtcac acattcttta 300
ccctctccca acttatacat gctttatccc cccagtcatg tgctatgtag gtataaaaaa 360
ataaagttgt atctaaacaa gtgatttaaa aaaaaaaact aacgaatgcc ncnatnataa 420
cnctgaactt gtttccctnt tgaaggacat tggaaatgtt accgaggttn ntttacctng 480
gccgcaaccn cnctangggc naattccagc ncactggggg ccgttactag gggat 535

<210> 662
<211> 257
<212> DNA
<213> Homo sapien

<400> 662

cctgactaaa gcacatatca cactccctac acttccatgt tttctctccc atgtggaccc 60
tctgatgcat atcaagattc aagcgcctgt tgtagccctt cccacagtcc tcacatttgt 120
atggcttttc tacactgtga actttttctt gcactttaga gaatgaattc tgtacaatgt 180
tcttcccatg ctgctcacat ttgagaggtg tttctctgct gtggcgtctc tgatgggtca 240
gacgagttga ggaccag 257

<210> 663
<211> 516
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(516)
<223> n = A,T,C or G

<400> 663
ccaattatag gtattttatt ttttaaagat tagagngttc ttgaagctct ttctatttct 60
ttgtcaatga actaaacatt ggcaaatatg tagggtttcc cacataagaa cattattaac 120
atcaaaatag aaagctggtg gtagaaataa tgattgggaa cacagagtct ctactcagcg 180
ttctacttct gccataccat aactttgtga tctcacgaaa tatctctcca tgttctcatc 240
cctatgtata gttctgtcat ttttcaataa gagctttttg cttaattatg aagtactagt 300
tactataacc attattttga gcttcatgta aatcaagaac acatggactc cacttgcaaa 360
acattgaaaa tgtagttagg gattgggggc aaaaagcaac attttaaaat gtgtaaagac 420
aatgagtaag caacaaagtg tccaattttt taggcgaaag ttgcatatgt caggaaaagg 480
caggattaag taatagagaa tttgaatgat aactgg 516

<210> 664
<211> 212
<212> DNA
<213> Homo sapien

<400> 664
gtccgaggag gttagttgtg gcaataaaaa tgattaagga tactagtata agagatcagg 60
ttcgtccttt agtgttgtgt atggctatca tttgttttga ggttagtttg attagtcatt 120
gttgggtggt aattagtcgg ttgttgatga gatatttgga ggtggggatc aatagagggg 180
gaaatagaat gatcagtact gcggcgggta gg 212

<210> 665
<211> 408
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(408)
<223> n = A,T,C or G

<400> 665
atccaggggt ncccggtngc tgcngggaaa cctccagcct tgttcttcaa accactcagc 60
tcatgtgttt tgcgctgact agtactgaat aatacaacca ctcttattta atgttagtat 120
tatttatttg acaactcagt gtctaacagc ttgatatgca ggtccttgca tcctacattt 180
ctttaggaag ttacccattt gtaactttaa aaacaggaaa aatatcagtt ggcaaatgca 240
atcttttttt tttttaagct aaagggggggn naacngnaan naaaatnttt ntgangtngg 300
gtctataagc acccttgang ggatntgtta aaagngncat naangggggga ttctcntttn 360

gcaaaaaaat ntaannatca atttatanan ctttattttt nactttnt 408

<210> 666
<211> 635
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(635)
<223> n = A,T,C or G

<400> 666
ctgaagnaca agggtcaggc aaaaataaga tcacaatcac caatgaccag aatcgcctga 60
cacctgaaga aatcgaaagg atggttaatg atgctgagaa gtttgctgag gaagacaaaa 120
agctcaagga gcgcattgat actagaaatg agttggaaag ctatgcctat tctctaaaga 180
atcagattgg agataaagaa aagctgggag gtaaaccttc ctctgaagat aaggagacca 240
tggaaaaagc tgtagaagaa aagattgaat ggctggaaag ccaccaagat gctgacattg 300
aagacttcaa agctaagaag aaggaactgg aagaaattgt tcaaccaatt atcagcaaac 360
tctatggaag tgcaggccct ccccaactg gtgaagagga tacagcagaa aaagatgagt 420
tgtagacact gatctgctag tgctgtaata ttgtaaatac tggactcagg aacttttgtt 480
aggaaaaaat tgaaagaact tanctctcga atgtcattgg aatcttcacc tcacagtggn 540
gttgaaactg ctatagccta agcnggctgt ttactgnttt ncattagcag gtgctcacca 600
tgtctttggg gtgggngggg ggagaaagaa agaan 635

<210> 667
<211> 388
<212> DNA
<213> Homo sapien

<400> 667
gaaggtgata taaaatgact gtcatcattt ggagtgtgca gtacagttac ttcatgttcc 60
tcaggtttag aacaatttcc cctgtaagtt ctcacacaga taggcagaaa tcataactaa 120
ttttggttaa tcactatggc agccgttgaa gaatttaaga gaacctgcca gtaagatttg 180
gaataagatt ctatattatt gcatccacag aaaagaatgt actgatatac tataaactct 240
aggagaaaac ttaattgaaa tagtgttatt aagtgttgaa agtaccataa aaatataagg 300
gaaaataagc tttcctagaa tttttcagtg ttctagtttt taaacagtga tgttttttat 360
taacctattt catccattca aagacagg 388

<210> 668
<211> 498
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(498)
<223> n = A,T,C or G

<400> 668
tgatcttaac aaaattcgta gcagtggaac cttgaaatgc atgtggctag atttatgcta 60
aaatgattct cagttagcat tttagtaaca cttcaaaggt ttttttttgt ttgttttcta 120
gacttaataa aagcttagga ttaattagaa gaagcaatct agttaaattt cccatttgta 180
ttttattttc ttgaatactt ttttcatagt tattcgttta aaaagattta aaaatcattg 240
cactttggtc agaaaaataa taaatatatc ttatgaatgt ttgattccct tccttgctat 300

ttttattcag tagatttttg tttggcatca tgttgaagca ccgaaagata aatgattttt 360
aaaaggctat agagtccaaa ggaatgttct tttacaccaa ttcttccttt aaaaatntct 420
gaggaatttg ttttcgcctt actttttttt cttctgtcac aatgctaagn ggtatccgag 480
gttnttaata tgagattt 498

<210> 669
<211> 622
<212> DNA
<213> Homo sapien

<400> 669
ccttagccaa agaatgcagt ggagccttcc cccttcaact gcattgtgaa tgaataccaa 60
ttaacagcat aaaaattaat agtcccatat cagatctgga aggggtttct ggggctgtct 120
gatgtcccta tcctgttgta gtgaacacaa tagcagaaaa ttctttctgg gtccatctgc 180
tataaagtct tggtaaaaca gcattactat gaagaggatg aactcaccta ccttcagatg 240
gaggaaaagt gaaaaggact taggctttag tcctccatga cttttcttaa gcactaccta 300
cctgtaataa gctgagtgca aaaggatgcc gaagaaaatc tgcacccaga agctgttaga 360
aagcactgca gagaacaggg tatgaagaaa ataaagagtt cttaataaac ccttaagatt 420
ctttgttcaa ggtaaccttg ccaaaagggc agagtaggtg gcaaagagtt gcttttaatc 480
tagctctaca ctgcatttga aaataaaatt tgcccatttt gaatatattg tttataatta 540
aatgtgcttt ttacactgca ggtcaatata aaaactggtt agtaaatttc cagcgagcat 600
ttatgttcat ttgctcacag ca 622

<210> 670
<211> 477
<212> DNA
<213> Homo sapien

<400> 670
ttgggccctc tagatgcatg ctcgagcggc cgccagtgtg atggatatct gcagaattcg 60
ccсttgcсgc ccgggcaggt gatggatgag gagcaaaaac tttatacgga tgatgaagat 120
gatatctaca aggctaataa cattgcctat gaagatgtgg tcgggggaga agactggaac 180
ccagtagagg agaaaataga gagtcaaacc caggaagagg tgagagacag caaagagaat 240
atagaaaaaa atgaacaaat caacgatgag atgaaacgct cagggcagct tggcatccag 300
gaagaagatc ttcggaaaga gagtaaagac caactctcag atgatgtctc caaagtaatt 360
gcctatttga aaaggttagt aaatgctgca ggaagtggga ggttacagaa tgggcaaaat 420
ggggaaaggg ccaccaggct ttttgagaaa cctcttgatt ctcagtctat ttatcag 477

<210> 671
<211> 127
<212> DNA
<213> Homo sapien

<400> 671
gtgtgtgtgt ctacttgggc gtgtttaacg tgtgcgtttg tgtctgcgtg tgcatgtgtc 60
tgtgtgtgcg cgtgtatttc agtttgggtt gccggatccc atatgattgc gtgcctgtgt 120
acctgag 127

<210> 672
<211> 400
<212> DNA
<213> Homo sapien

<400> 672
gggtctgcac agctatgtta acagcatcct tataccagga gtaggaggaa agacacgact 60

ggaaaagcaa ttcaagctgg tcacacagtg taatgcaaaa tatgtggaat gtttcagtgc 120
tcagaaagag tgtaacaaag aaaagaacag aaactcttca gttgtgccat ctgagcgtgc 180
tcgagtgggt cttgcaccat tgcctggaat gaaaggaaca gattacatta atgcttctta 240
tatcatgggc tattatagga gcaatgaatt tattataact cagcatcctc tgccacatac 300
tacgaaagat ttctggcgaa tgatttggga tcataacgca cagatcattg tcatgctgcc 360
agacaaccag agcttggcag aagatgagtt tgtgtactgg 400

<210> 673
<211> 600
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(600)
<223> n = A,T,C or G

<400> 673
ctggcgttgc tcattagtga atgtatgaca gcaggatgtg aggggatgcc caggagtcag 60
tgttagcatt gtcatctgag atcactgcta ttaatatcat ccattaattt attagtgagc 120
ttcactatat gcagactggg agataaggag aaaatctgtc acattctctc tagctaatca 180
gatcagctac caattaatga gattctgaat gaaatatcaa tatgtgtttt tctaatttgg 240
acctaggaca gagctgttgc ttgtcataga gaaaaacaat aatgcttaaa catagcacat 300
tataattaaa gcaggtttct cacatacttt tcattttatc ctttggataa ttttgtgagg 360
aacgcaggac accaacttcc ctttcataga tacaatcccc atgctattga tgaaagtgtt 420
tttgaatgaa gccatacaac aaataactga tcaaagtggc attacaccaa aatttcttag 480
taggactcct gcatagaatg tttagataga cgtgaaaagt ttgttcanga ggaccagcaa 540
gagagaaact gggttctttg ggagggtttc ggtgctacat ttataccctn catcagagtn 600

<210> 674
<211> 140
<212> DNA
<213> Homo sapien

<400> 674
ggtggttggt gtaaatgagt gaggcaggag tccgaggagg ttagttgtgg caataaaaat 60
gattaaggat actagtataa gagatcaggt tcgtccttta gtgttgtgta tggctatcat 120
ttgttttgag gttagtttga 140

<210> 675
<211> 245
<212> DNA
<213> Homo sapien

<400> 675
gttgggtggt tggtgtaaat gagtgaggca ggagtccgag gaggttagtt gtggcaataa 60
aaatgattaa ggatactagt ataagagatc aggttcgtcc tttagtgttg tgtatggcta 120
tcatttgttt tgaggttagt ttgattagtc attgttgggt ggtaattagt cggttgttga 180
tgagatattt ggaggtgggg atcaatagag ggggaaatag aatgatcagt actgcggcgg 240
gtagg 245

<210> 676
<211> 621
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(621)
<223> n = A,T,C or G

<400> 676
ctgtccccag ggnaaatagt ngaattcaac taagatctgt taataagatg tcagaataac 60
taataatttt attaggaaaa aatcatgttt taaatttcaa aatgacactt atttgtcaag 120
taatatgatc ttggaaaatt ttaaagaaaa ataatcctac ttataaacta ctttttttata 180
attgttttca gaaaaaaagt ttacagtctt aaggaaaata ttcaggtcta tcatatggtt 240
tgacagattt tttaaaagtt atttttggta aggtcttctt ttagaaaaaa attaatctca 300
agggtttttt gtaccactat aatctctaat acttactcag aattactgtg tatttactta 360
atttcttatt atgtgcctta ttatgtgctt aagatacaat aggttagagt ttaatctaaa 420
tatcttgaaa gctatattgt gggcttggta agcattttgt tttttctttc tctgttttgg 480
taaggattta aaattttttt cattgcaatt ttaagtggtt ttcaataagt aatagttttt 540
atcaaatttt tggtgcttgg tgcagagacg gcgtggggaa gggtgaatgg ttttgggaat 600
aattcagtgc acacctgggg g 621

<210> 677
<211> 210
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(210)
<223> n = A,T,C or G

<400> 677
tttacataan atattatcag catttaccat ctcacttcta ggaatactag tatatcgctc 60
acacctcata tcctccctac tatgcctaga aggaataata ctatcactgt tcattatagc 120
tactctcata accctcaaca cccactccct cttagccaat attgtgccta ttgccatact 180
agtctttgcc gcctgcgaag cagcggtagg 210

<210> 678
<211> 383
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(383)
<223> n = A,T,C or G

<400> 678
gtaggagtca ggtagttagg gttaacgagg gtggtaagga tggggggaat tagggaagtc 60
agggttaggg tggttatagt agtgtncatg gttattagga aaatgagtag atatttgann 120
aactgattaa tgtttgggnn tgagtttnta tatcacagcc anaattntat gatgnaccat 180
gtancgaaca atgctacagg gatgaatatt atggagaagt antctanttt gaagcttagg 240
gagagctggg ttgtttgggt tgnggctcan tgtcagttcc anataataac ttcttggtct 300
aggcacatga atattgttgt ggggaanaga ctgataataa aggtggatgc gacaatggat 360
tttacataat gggggtatna gtt 383

<210> 679

<210> 684
<211> 277
<212> DNA
<213> Homo sapien

<400> 684
tggtattagg attaggatgt gtgaagtata gtacggatga gaaggttggg gaacagctaa 60
ataggttgtt gttgatttgg ttaaaaaata gtagggggat gatgctaata attaggctgt 120
gggtggttgt gttgattcaa attatgtgtt ttttggagag tcatgtcagt ggtagtaata 180
taattgttgg gacgattagt tttagcattg gagtaggttt aggttatgta cgtagtctag 240
gccatatgtg ttggagattg agactagtag ggctagg 277

<210> 685
<211> 457
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(457)
<223> n = A,T,C or G

<400> 685
ctgtggcgtn ccctacttct cccaaacctc gcaactccct cccaggacag tcagtgccaa 60
agaaacaggt cgctgaaaac taaaatgtcc acatccctaa ctggcaaccc acatcaaccc 120
caaaaggttg aagaatcatc taagatattt cagatgctct atgaagaaat tcactttaac 180
acttataact gtaagacttt gcatacatta caacagtgca ttagtgatac aagttgtaaa 240
atacgtttcc attcctttgg attttgcata tgatggtttt gcatcagtca ctgcaggtag 300
attgagcaag ctttttgtgt ttgttttttt aaacatgcat tcaactagat atgattcaga 360
atagattaat actccctttt tatcactaca gttagctaaa aaattgccag gcagtccaca 420
aaacagaatt tgctttaaga ccaacccaca gagtcag 457

<210> 686
<211> 234
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(234)
<223> n = A,T,C or G

<400> 686
ntggatttat aaaatagttg caatgacaaa agaagtatgt tttgacagta aaaaaaagac 60
attatggaca aaatatgcaa aatgtgcaaa gaaaaaataa atttgcatta gaaaggtggg 120
catttgatct ctgagccctg tgccatgtaa cattgccatg ttctttcact gttgtttgaa 180
tgttgtaccc cagcccttga ctctggactt aaggcaagct atgactggct ttgg 234

<210> 687
<211> 315
<212> DNA
<213> Homo sapien

<220>

<211> 371
<212> DNA
<213> Homo sapien

<400> 679
aaaatgaaaa cattgacaag agcttcagat agaaaatgaa aaagaaggta agacaagtat 60
tggagaagta tagaagatag aaaaatataa agccaaaaat tggataaaat agcactgaaa 120
aaatgaggaa attattggta accaatttat tttaaaagcc catcaattta atttctggtg 180
gtgcagaagt tagaaggtaa agcttgagaa gatgagggtg tttacgtaga ccagaaccaa 240
tttagaagaa tacttgaagc tagaagggga agttggttaa aaatcacatc aaaaagctac 300
taaaaggact ggtgtaattt aaaaaaaact aaggcagaag gcttttggaa gagttagaag 360
aatttggaag g 371

<210> 680
<211> 176
<212> DNA
<213> Homo sapien

<400> 680
cctaggattg tgggggcaat gaatgaagcg aacagatttt cgttcatttt ggttctcagg 60
gtttgttata attttttatt tttatgggct ttggtgaggg aggtaagtgg tagtttgtgt 120
ttaatatttt tagttgggtg atgaggaata gtgtaaggag tatgggggta attatg 176

<210> 681
<211> 152
<212> DNA
<213> Homo sapien

<400> 681
ctggagatgg atatgagact agtcaagatg tgaatgctaa ttggagagaa atataatttt 60
aggaagatgc acattgatgt ggggttttga tgtgtctgat tttgactact caagctctgt 120
ttacagaaga aaattgaatg gcgagggtgt gg 152

<210> 682
<211> 141
<212> DNA
<213> Homo sapien

<400> 682
ccagtgcttg cttgccgtgg tttagtgatt gggtgttaga aataaaaact caggtctatt 60
tcttaccagt cagtaacaat ttttagagaa tgtacttggt atataatata tggacttcag 120
gaactttgtt ggggtggggg g 141

<210> 683
<211> 308
<212> DNA
<213> Homo sapien

<400> 683
ccagcaatgg tacagagtga gggtgttctg ctaatgactt cagagaagta tttaagaaaa 60
acatagaaaa acgtgtgcgg agtttgccag aaatagatgg cttgagcaaa gagacagtgt 120
tgagctcatg gatagccaaa tatgatgcca tttacagagg tgaagaggac ttgtgcaaac 180
agccaaatag aatggcccta agtgcagtgt ctgaacttat tctgagcaag gaacaactct 240
atgaaatgtt tcagcagatt ctgggtatca aaaaactaga acaccagctc ctttataatg 300
catgtcag 308

<221> misc_feature
<222> (1)...(315)
<223> n = A,T,C or G

<400> 687
nngtctgtga aaaactcttt ggatgattct gccaaaaagg tacttctgga aaaatacaaa 60
tatgtggaga attttggtct aattgatggt cgcctcacca tctgtacaat ctcctgtttc 120
tttgccatag tggctttgat ttgggattat atgcacccct ttccagagtc caaacccgtt 180
ttggctttgn gtgtcatatc ctattttgtg atgatgggga ttctgaccat ttatacctca 240
tataaggaga agagcatctt tctcgtggcc cacaggaaag atcctacagg aatggatcct 300
gatgatattt ggcag 315

<210> 688
<211> 522
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(522)
<223> n = A,T,C or G

<400> 688
ctgaattaga ggaggagaaa agaagccatt nnggagtact ttaattgttt agatgtgaga 60
ggctgaatgt ttgggttaag atgttagttg tcagaatcat gagaaaaggt tttaagcaag 120
gggcatttct aattctaaaa ataacaacta ctgttattta ttgagcacta tctttttgtt 180
gggtactgtc taaagtactt gatttatttt ttaaaacctt acaaaaaact tacaaggtag 240
gtactgaaag attcagtaat ttgttcaaag tcacacagca aataagcaac agactctgga 300
tttgaaccag gcaatcctag agcctgtact gttagtaatt atactttagc acctgtcaag 360
aattcctgtt gagtgtcaag aagcaancac caagttagga tttaaagcaa acatgattga 420
agaatactgt ggtgtggttg acagtagtgc ctaagtctgt tttcagagtg aaaaatgaca 480
aattagattt taagtatggt ttggagataa tatcaggaca gt 522

<210> 689
<211> 158
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(158)
<223> n = A,T,C or G

<400> 689
tctcaactta ntntnatacc cacacccacc caanaacagg gtttgttagg nattgtttgc 60
attaataaat taaagctcca tagggtcttc tcgtcttgct gtgtcatgcc cgcctcttca 120
cgggcaggtc aatttcactg gttaaaagta agagacag 158

<210> 690
<211> 300
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature

<222> (1)...(300)
<223> n = A,T,C or G

<400> 690
tagaactcgt atttttaaac ttctattctc tancctttc cactacatta tgacacaaga 60
ccctgcagaa agtcgtctgg [illegible] [illegible] [illegible] [illegible] 120
catcgaatta tatgcaccct taaaaagtta tttggagttt taaaaaactc tattagccca 180
aattacctga aataaactcc tggcttgttc ccctaatgtt tataaaaaat tgattgaaaa 240
tattcatttt aaaaatgaag ntcttgaatt tatttaaatt actgtcttgc agtgagttgg 300

<210> 691
<211> 305
<212> DNA
<213> Homo sapien

<400> 691
ctgttcagaa agctcattgg acctggtttt gaaaataaaa caaagttaaa accctgggag 60
gagttattgt gcagtgtgga gtactcaggc tttcttataa agaaaaaaaa agttatctgg 120
taccaaagtg tgcaacctac agaccctcag gtactgccct gtgacttctc tgtatgacat 180
cacaaggctg ccaagtgcct gtttttctag aactaggagt tggtgaggtt tggctagtgc 240
tgaaaccatg cataggattg gtttactaaa ttaaaacctt attacgtacg tcctccaaaa 300
gacag 305

<210> 692
<211> 582
<212> DNA
<213> Homo sapien

<400> 692
caggaaatgg ataaccattt taactgtatt ttttgcagcc cgtaccttct tgggaataca 60
attgtctaac tttttatttt tggtctggct gttgtggtgt gcaaaactcc gtacattgct 120
attttgccac actgcaacac cttacagatg tggaagatgt gaaatttgtc atcaattatg 180
actaccctaa ctcctcagag gattatattc atcgaattgg aagaactgct cgcagtacca 240
aaacaggcac agcatacact ttctttacac ctaataacat aaagcaggtg agcgacctta 300
tctctgtgct tcgtgaagct aatcaagcaa ttaatcccaa gttgcttcag ttggtcgaag 360
acagaggtgc aggtaaggat gactgatagg aaatgttggt agttacgagt cacatcgttg 420
tctacaaatc catttaaatg gtattggagg gtgagtaaaa ccttgaatgt gaaaacttaa 480
gctgaaaaat tgtaaaaaca tttcacgcct accatgaata gatctgtttc tttctgtcca 540
caatgatttg tgtcatagac ataattgatc aatttgcaat tg 582

<210> 693
<211> 275
<212> DNA
<213> Homo sapien

<400> 693
ccaattgatt tgatggtaag ggagggatcg ttgacctcgt ctgttatgta aaggatgcgt 60
agggatggga gggcgatgag gactaggatg atggcgggca ggatagttca gacggtttct 120
atttcctgag cgtctgagat gttagtatta gttagttttg ttgtgagtgt taggaaaagg 180
gcatacagga ctaggaagca gataaggaaa atgactatga gggcgtgatc atgaaaggtg 240
ataagctctt ctatgatagg ggaagtagcg tcttg 275

<210> 694
<211> 397
<212> DNA

<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(397)
<223> n = A,T,C or G

<400> 694
nggtctgcat ttttattgcg atctgcagat gaactggaaa atctcatttt acaacagaac 60
tgagacagac gaccaccata ttcactgagg tctaaatttg cagtttccac taatgacatt 120
ttgatttccc aacagagata cttctggtct tactgcacag tcttttaaga gaaatacttc 180
cattatgcca cattgtcctt gatccgtaag tgatgtgtta aggtgcttca aaggaactct 240
gacctctgaa gtacttgagc tactttagta tgtccagcct attgcttttt gttttagtgt 300
gtcaccatаa atatcagggg cataaaaggc tatctattct taattcaagg ataaaacaga 360
agaagcttgt ggtataaaac aatagttcaa gatccag 397

<210> 695
<211> 609
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(609)
<223> n = A,T,C or G

<400> 695
ctgagcttcc atttgtcagc tagcactgng gtagtcaacc atgcgaatga ggctattttg 60
gacctcatga ttgtccagtg cctgggctga taccgnggga aacgaaattt tgtggctgcc 120
cacaaaatca tggaaaataa tgatttttta gaaaacctcc actgntttgt tgtgcagcaa 180
taaataactg aaacaccaat ccaaaaaact tataaagcta taacaattaa aacagnataa 240
taatagtncc gggatacaaa aatggtcaaa ttgaagagga tacaaagcct caaagcagtc 300
ctcactcata ananccttgt tgtatcacta aaanggcatt aaaattgaga anaaggaana 360
actagtggat taattaataa atgagaagta tccataagga aaaattaaaa ttnnattctt 420
gcttcacatt atgaaaaaat acaaacaaca gattgattaa agacttaaat gngatcaaca 480
aaatgttaaa actgtgataa gaacatttaa gaaaatagtt ctatnaccct gggataaaac 540
attttcntcc aaggcattaa agtgttaaat gaaaagactg atncatttat tcattagaat 600
ttaaattcn 609

<210> 696
<211> 300
<212> DNA
<213> Homo sapien

<400> 696
ctgcaaaata agcgtgctaa attaaattgt cttaaggttt ttccacttca ttttgtgact 60
ttgtgtggtt cgaatttctc agtattttaa ccagtgtgtt gatgttaaag tcaaaggctg 120
cagtatgtct atattcttgc tgtactcatt ggtagtttca gtatatgtaa tgtgagttta 180
aatagtgaaa ttgtatctca tattaacatt tcaaatgctc atattgaaaa tggaaaatag 240
taaacacggg aattgatttt attctggttg tctataatac ttcattttaa atgtaaatgg 300

<210> 697
<211> 391
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(391)
<223> n = A,T,C or G

<400> 697
```
nngtcatgtn tgatgnatct gancaggttg ctccacaggt agctctagga gggctggcaa      60
cttagaggtg gggagcagag aattctctta tccaacatca acatcttggt cagatttgaa     120
ctcttcaatc tcttgcactc aaagcttgtt aagatagtta agcgtgcata agttaacttc     180
caatttacat actctgctta gaatttgggg gaaaatttag aaatataatt gacaggatta     240
ttggaaattt gttataatga atgaaacatt ttgtcatata agattcatat ttacttctta     300
tacatttgat aaagnaaggc atggttgtgg ttaatctggt ttatttttgn tccacaagtt     360
aaataaatca taaaacttga acaaaaaaaa a                                    391
```

<210> 698
<211> 536
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(536)
<223> n = A,T,C or G

<400> 698
```
ctgagcatac agcaataaaa ataacataat ttttatgtgt acaatattta tggaatacgt      60
tactggaaca gataaataat ttagttaata acatgacaaa gaacagaaat tgtatacact     120
atacagcata gtaatagaat aatgaatgat taaagttatt aatattaggt agaaaatgaa     180
gggtatcttt gagagcagaa ctcaaggaag caagcaattt gccttatgag gaaagagtta     240
cctgtggata aaggagaaac tgaaaaattt acaagtcaag actttttgag caaagacaaa     300
aatatgacta tgagtcacca attcagtaca gtgaaaaaaa agttgaagag atatcttgga     360
agtaaaccat gttgtggaag agcagggttt tgataatcat gggattattc tgaatgaatt     420
ttaaatgcga taggaatata tgagataatt tcaccagaga ataatatgat catgtttgca     480
tttcaaaggg gtgtatctgg tgcactgngt agaataaata ggntatgtga gcaagt         536
```

<210> 699
<211> 419
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(419)
<223> n = A,T,C or G

<400> 699
```
ngtccacctg agggcaggtg acaaggacct gacagagccc atgcagggct ttagatttgg      60
acacacaaga gttgataact tcctcatgaa ctccttgcct gatctaaact catattatgg     120
gttctgactg tttgagtaat catcttcaag gttaaacctc ttggcagtta ccctttttcac    180
aaagtgcaca gtgggaatcg agaatcgata gggttaattt tggagcagtg gcttatacca     240
ttcacctctg ttttttgtg attatttcac agataatgag accttaataa caaataggcg      300
taaaaaaatt ttcacattga aatgatagaa acatttgatg taataaaact tggttggctt     360
gatattttaa ggaattgaaa cctagcaatc ttattggaga gacaagaatt ggtctccag      419
```

<210> 700
<211> 336
<212> DNA
<213> Homo sapien

<400> 700
ccacttattg tccttaaaaa tccatactga tacatggaca gtaagtgtgt tttcagatgg 60
agtaccagca ccgaaaatgg gttgagggag gatgggttgt atgtatgttt ctgcccacta 120
attttgagca gccatattat gaattaaatc gtcacagcca agtaataacc caagaatggt 180
atgagtttca tgtgtaatag ctcaaatgga ataagcatga atgctggagt ggaccattat 240
cctcaaatat tctatgtcac ttctcattta aagactcttg ttatgaacta ttagaaactt 300
taggcaaaat caaaagtatt tgcggcaaaa taaagg 336

<210> 701
<211> 418
<212> DNA
<213> Homo sapien

<400> 701
ccatgtgatg atgttgacaa cccctgaaga gcctcagtcc attgttccac gtttaagaac 60
taggaatacc aggactgatg caattctact gggtcactat cgcttgtcac aagacacaga 120
caatcagacc aaagtatttg ctgtaataac taagaaaaaa gaagaaaaac cacttgacta 180
taaatacaga tattttcgtc gtgtccctgt acaagaagca gatcagagtt ttcatgtggg 240
gctacagcta tgttccagtg gtcaccagag gttcaacaaa ctcatctgga tacatcattc 300
ttgtcacatt acttacaaat caactggtga gactgcagtc agtgcttttg agattgacaa 360
gatgtacacc cccttgttct tcgccagagt aaggagctac acagctttct cagaaagg 418

<210> 702
<211> 261
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(261)
<223> n = A,T,C or G

<400> 702
gggcctgttg tgggggtggg ggaagcaggg aggggaacag ctaaataggt tgctgttgat 60
ttggttaaaa aatagtaggg ggatgatgct aataattagg ctgngggtgg ttgtgttgat 120
tcaaattatg tgtttttggg agagtcatgt cagtggtaga aatataattg ttgggacnat 180
tagntttagc attggagtag gtttaggtta tgtacgtagt ctaggccata tgtgttggan 240
attgagacta gtagggctag g 261

<210> 703
<211> 261
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(261)
<223> n = A,T,C or G

<400> 703

gggcctgttg tgggggtggg ggaagcaggg aggggaacan ctaaataggt tgctgttgat 60
ttggttaaaa aatagtaggg ggatgatgct aataattagg ctgngggtgg ttgtgttgat 120
tcaaattatg tgttttttgg agagtcatgt cagtggtagt aatataattg ttgggacnat 180
tagntttagc attggagtag gtttaggtta tgtacgtagn ctaggccata tgtgttggag 240
attganacta gtagggctag g 261

<210> 704
<211> 381
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(381)
<223> n = A,T,C or G

<400> 704
ngtntgaatt ctattaaaga tacaaagagg agctggtacc atttcttctg aaactattac 60
aaacaactga aaaggtggaa tttctcccta attcatttta ggaggccagc attatactga 120
taccaaaacc tggcagaggt acaataataa aaggaaactt caagtcagta tcactgatga 180
acaccaatgt gaaaatcctc aataaaatac tggcaaactg aattcagcag cacatcaaaa 240
agctaatcca ccacaatcaa gtcagcttca tccctgcgat gcaagtctgg ttcaacatat 300
gcaaatcaat aaatacaatt catcagataa acagagctaa agacaaaatt cacatgattt 360
tctcaataga tgcagaaaag g 381

<210> 705
<211> 477
<212> DNA
<213> Homo sapien

<400> 705
ctgaaccctc gtggagccat tcatacaggt ccctaattaa ggaacaagtg attatgctac 60
ctttgcacgg ttagggtacc gcggccgtta aacatgtgtc actgggcagg cggtgcctct 120
aatactggtg atgctagagg tgatgttttt ggtaaacagg cggggtaaga tttgccgagt 180
tccttttact ttttttaacc tttccttatg agcatgcctg tgttgggttg acagtgaggg 240
taataatgac ttgttggtga ttgtagatat tgggctgtta attgtcagtt cagtgtttta 300
atctgacgca ggcttatgcg gaggagaatg ttttcatgtt acttatacta acattagttc 360
ttctataggg tgatagattg gtccaattgg gtgtgaggag ttcagttata tgtttgggat 420
tttttaggta gtgggtgttg agcttgaacg ctttcttaat tggtggctgc ttttagg 477

<210> 706
<211> 266
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(266)
<223> n = A,T,C or G

<400> 706
ccatggctag gtttatagat agttgggtgg ttggtgtaaa tgagtgaggc aggagtccga 60
ggaggttagt tgtggcaata aaaatgatta aggatactan tataagagat caggntcgtc 120
ctttagtgtt gtgtatggct atcatttgtt ttgaggntag tttgattagt cattgttggg 180
tggtaattag tcggttgttg atgagatatt tggaggtggg gatcaataga gggggaaata 240

gaatgatcag tactgcggcg ggtagg 266

<210> 707
<211> 358
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(358)
<223> n = A,T,C or G

<400> 707
ccatcagaga aatgcaaatc aaaaccacaa tgagatacca tctcacacca gttagaatgg 60
caatcattaa aaagtcagga aacaacaggt gctggagagg atgtggagaa ataggaacac 120
ttttacaccg ntggtgggac tgtaaactag ttcaaccatt gtggaagtca gtgtggcgat 180
tcctcaagga tctagaacta gaaataccat ttgacccagc cggccaatat tcaacattct 240
taaaggaaag aattttcaac ccagaatttc atatccagcc aaactaagct tcgttagtga 300
aggagaaata aaatacttta cagacaagca aatactgaga gattttgtca ccaccagg 358

<210> 708
<211> 491
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(491)
<223> n = A,T,C or G

<400> 708
cctactatgg gngttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga 60
gctgttcctc tttggactaa cagttaaatt tacaaggggа tttagagggt tctgtgggca 120
aatttaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggt 180
ttgtcgcctc tacctataaa tcttcccact attttgctac atagacgggt gtgctctttt 240
agctgttctt aggtagctcg tctggtttcg gggtcttag ctttggctct ccttgcaaag 300
ttatttctag ttaattcatt atgcagaagg tataggggtt agtccttgct atattatgct 360
tggttataat ttttcatctt tcccttgcgg tactatatct attgcgccag gtttcaattt 420
ctatcgccta tactttattt gggtaaatgg tttggctaag gttgtctggt agtaagggng 480
gagtgggttt g 491

<210> 709
<211> 460
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(460)
<223> n = A,T,C or G

<400> 709
nggttttttt tgtagagcaa ataatttatg caaaatatgt tacaaaatct gggatgctaa 60
atagttgaca caagtactgt gtttgacatt tagtttcatt tgaattagta atagaatttg 120
ctccttccaa catttacatc ttttttcttt ctgactttat atattttcaa taaaaatttg 180

```
ctccacagtt tttaagntca ttcttcttga atccgntttt acatttgctg ngacaaacct     240
gcataaaact agattttata gatataactt ctttggaaga gataaaaatt caaaagtttg     300
acattgcttt canttattct tttcttcatt gttttgattg gcccctgtta gattgatgta     360
ttgccaatct acttttgatg gcatgaatnt aaaatgacaa cataaaaagc ncttctagtg     420
caacagtaat tgaaacttgc agttttccat taaaaaaaaa                           460
```

```
<210> 710
<211> 542
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(542)
<223> n = A,T,C or G

<400> 710
ctgttacagt gacaagagat aaaaagatag acctgcagaa aaaacaaact caaagaaatg      60
tgttcagatg taatgtaatt ggagtgaaaa actgtgggaa aagtggagtt cttcaggctc     120
ttcttggaag aaacttaatg aggcagaaga aaattcgtga agatcataga tcctactatg     180
cgattaacac tgtttatgta tatggacaag agaaatactt gttgttgcat gatatctcag     240
aatcggaatt tctaactgaa gctgaaatca tttgngatgt tgtatgcctg gtatataatg     300
tcagcaatcc caaatccttt gaatactgtg ccaggatttt taagcaacac tttatggaca     360
gcagaatacc ttgcttaatc gtagctgcaa agtcagacct gcatgaagtt aaacaagaat     420
acagtatttc acctactgat ttctgcagga aacacaaaat gcctccacca caagccttca     480
cttgcaatac tgctgatgcc cccagtnagg atatctttgt taaattgaca acaatggacc     540
tg                                                                    542

<210> 711
<211> 394
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(394)
<223> n = A,T,C or G

<400> 711
caaacccact ccaccttact accagacaac cttagccaaa ccatttaccc aaataaagta      60
taggcgatag aaattgaaac ctggcgcaat agatatagta ccgcaaggga aagatgaaaa     120
attataacca agcataatat agcaaggact aacccctata ccttctgcat aatgaattaa     180
ctanaaataa ctttgcaagg agagccaaag ctaagacccc cgaaaccaga cgagctacct     240
aagaacagct aaaagagcac acccgtctat gtagcaaaat agtgggaaga tttataggna     300
gaggcgacaa acctaccgag cctggtgata gctggttgtc caagatagaa tcttagttca     360
actttaaatt tgcccacaga accctctaaa tccc                                 394

<210> 712
<211> 552
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(552)
```

<223> n = A,T,C or G

<400> 712
gaggtctgta naatgccagg ctcaaatttg tctttataat ttaataccag aaatctttcc 60
cttgtgatgt ttctttcttt ctggattgcc tctatagcag gggatagcgg gggaggataa 120
ggcacatctt tgntgtactg agaaatttga ccacgcagga tgatgtggct gttctcattc 180
atctgcacag agaaaaataa tgataaaata tccctttcct atgtttactg attttatggc 240
tgccataatg gaagcctcct tgactattta atcctttctg tcaactaggt tcgatttttt 300
ttttaattta cctgttagag gtatttaana attttaacta gctanaaata attacattcc 360
aaaggaacac caaggcaaat aaatggttgg taatcagcaa aagaattaca ttagttgttg 420
ntgctactta ttagggggag aactgttttt ttttaaattt aaacaattta ataatctcaa 480
ctgcaaataa ttttagatgc agcaaaggac tatgtagncg ttaatacctc atgttgatat 540
tttcataata tt 552

<210> 713
<211> 518
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(518)
<223> n = A,T,C or G

<400> 713
ccaaaaactg gaagcagctc actaaacaaa cagtggcata cccatagaac tgcatacttc 60
tcagcagtat gaaagaatga gctacttata taagcatcat tgataaacct caaaaaaaaa 120
atgccacatg aanaaaccca aaggggganaa acataaaaac tttatatgtc agtcatataa 180
aattctanaa aatgcaaact aatccatcnt aaaggaaagt aaatcaacag ttgtctggag 240
gaccananag agcaggagga ganagattat taaaggggtt aaagtaaatt tgggagtgcc 300
cttccntttt taaatnctat gaaaatgaaa gtaaaggcnc atgcatgttg taaactaata 360
gtaacaaaca naatgggttg gagtggggtg ttgtctgggg acatcattac aaaatgtaag 420
ccagtttatn taaatttga aaagaccgtg gactctgatc tgactgatna atgttggaag 480
agataagtgt gctgcaaatg gggaattaa taaaacag 518

<210> 714
<211> 281
<212> DNA
<213> Homo sapien

<400> 714
ccaattgatt tgatggtaag ggagggatcg ttgacctcgt ctgttatgta aaggatgcgt 60
agggatggga gggcgatgag gactaggatg atggcgggca ggatagttca gacggtttct 120
atttcctgag cgtctgagat gttagtatta gttagttttg ttgtgagtgt taggaaaagg 180
gcatacagga ctaggaagca gataaggaaa atgactatga gggcgtgatc atgaaaggtg 240
ataagctctt ctatgatagg ggaagtagcg tcttgtagac c 281

<210> 715
<211> 443
<212> DNA
<213> Homo sapien

<400> 715
cttgaaatca gcaacacact tacaaatgag aaaatgaaaa tagaagagta tataaagaaa 60
gggaaagagg attatgaaga gagtcatcag agagctgtgg ctgcaggagt atccgtactt 120

gaaaactgga aggagagtga agtgtataag ctacagatca tggagtcaca agcagaagcc 180
tttctgaaga agctggggct gattagccgt gatcctgcag catatcccga catggagtct 240
gatatacgtt catgggaatt gtttctttct aatgttacaa aagaaattga gaaagcaaag 300
tctcagtttg aagaataaat taaggcaatt aaaaatggtt cccggctcag tgaactttct 360
aaagtgcaga tttctgagct ttcatttcct gcctgtaaca cggttcatcc cgagttactc 420
cctgagtctt caggccacga tgg 443

<210> 716
<211> 639
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(639)
<223> n = A,T,C or G

<400> 716
ccaaanaaaa tgaagtacag agtctgcata gtaagcttac agataccttg gtatcaaaac 60
aacagttgga gcaaagacta atgcagttaa tggaatcaga gcagaaaagg gtgaacaaag 120
aagagtctct acaaatgcag gttcaggata ttttggagca gaatgaggct ttgaaagctc 180
aaattcagca gttccattcc cagatagcag cccagacctc cgcttcagtt ctagcagaag 240
aattacataa agtgattgca gaaaaggata agcagataaa acagactgaa gattctttag 300
caagtgaacg tgattgttta acaagtaaag aagaggaact taaggatata cagaatatga 360
atttcttatt aaaagctgaa gtgcagaaat tacaggccct ggcaaatgag caggctgctg 420
ctgcacatga attggagaag atgcaacaaa gtgtttatgt taaagatgat aaaataagat 480
tgctggaaga gcaactacaa catgaaattt caaacnaaat ggaagaattt angattctaa 540
atgaccaaaa canagcatta aaatcagaag ttcagaagct gcagactctt gtttctgcac 600
angcctaata aggatgntgn ggaacaaatg gaaaaattg 639

<210> 717
<211> 473
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(473)
<223> n = A,T,C or G

<400> 717
nntgaggcta ctgctgtttt attacaacat tacctcttgt ttttataaag tgtaccaaga 60
tttaaattga taactttatt ttacttgaaa aaaaaaagtt tnttttatca ccagtgttac 120
agttgtcttc tgtttctttt tgttttgntt tatttgnttt ccttttttagc caaagagtga 180
acagaanatt ttcttatttt ggtggctatt cattttactt ttaaaagtga ttggtggatt 240
ttagactaat tatgggggaa tttgccacca aaataaaaaa tatgtaaagn gtagtgatta 300
cagagtggtt aaaatgtggg ttagtactta tttattccat taattgatta tttgactgtt 360
tataaagaaa gttgctttat ttctttaaac atcttcaaaa gatgatcctt tcttgtcaca 420
ttatagccaa aagaagcaga gaacttcact gtctgcattt ggttcctggt tgg 473

<210> 718
<211> 207
<212> DNA
<213> Homo sapien

<400> 718
ggtaaatgct agtataatat ttaccatctc acttctagga atactagtat atcgctcaca 60
cctcatatcc tccctactat gcctagaagg aataatacta tcactgttca ttatagctac 120
tctcataacc ctcaacaccc actccctctt agccaatatt gtgcctattg ccatactagt 180
ctttgccgcc tgcgaagcag cggtagg 207

<210> 719
<211> 255
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(255)
<223> n = A,T,C or G

<400> 719
cctatattac ggatcatttc tctactcaga aacctgaaac atcggcatta tcctcctgct 60
tgcaactata gcaacagcct tcataggcta tgtcctcccg tgaggccaaa tatcattctg 120
aggggccaca gtaattacaa acttactatc cgccatccca tacattggga cagacctagt 180
tcaatgaatc tgaggaggct actcagtaga cagncccacc ctcacacgat tctttacctt 240
tcacttcatc ttgcc 255

<210> 720
<211> 455
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(455)
<223> n = A,T,C or G

<400> 720
ccaatgtcga aacctacaag atttccttaa aatctctaat agaggcatta cttgctttca 60
attgacaaat gatgccctct gactagtaga tttctatgat ccttttttgt cattttatga 120
atatcattga ttttataatt ggtgctattt gaanaaaaaa atgtacattt attcatagat 180
agataagtat caggtctgac cccagtggaa aacaaagcca aacaaaactg aaccacaaaa 240
aaaaaggctg gtgttcacca aaaccaaact tgttcattta gataatttga aaaagctcca 300
tagaaaaggc gtgcagtact aagggaacaa tccatgtgat taatgnttnc attatgttca 360
tgtaanaagc cccttatttt tagccataat tttgcatact gaaaatccaa taatcagaaa 420
agtaattttg ccacattatt tatnaaaaat gttcc 455

<210> 721
<211> 530
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(530)
<223> n = A,T,C or G

<400> 721
ccagtgcttg ctgccgtggt ttagtgattg ggtgttagaa ataaaaactc aggtctattt 60

cttaccagtc agtaacaatt tttagagaat gtacttggta tataatatat ggacttcagg 120
aactttattg gggngggggg ttaattttgc cttaccctgt tcactttcag atgattaggc 180
ttttgcactt tagaatgaga aacttgtgac gttagtgtgt tcttactagc tttaatttgt 240
atgtagcaat gaattgtgaa tcttagtgca gtgggttttt ttaaaaaact caaaaagctg 300
ggaattaagt ggtttcagta ataatgctat accgaggtgc ttgcattgta tttcataatt 360
ttgttacaaa ccaaaattat ctttaatgan [illegible] 420
gaatgtattt tcgtactgtt aggcccttgg aacagatacc ggtgctttct tgaaagatga 480
aagaaatgca atgggtgctc ttcatgcaag gttgcaaacc taccaagaat 530

<210> 722
<211> 242
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(242)
<223> n = A,T,C or G

<400> 722
ccaagggtca tgatggcagg agtaatcana ggtgntcttg tgttgtgata agggnggaga 60
ggttaaagga gccacttatt agtaatgttg atagtagaat gatggctagg gtgacttcat 120
atgagattgt ttgggctact gctcgcagtg cgccgatcag ggcgtagttt gagtttgatg 180
ctcatcctga tnagaggatt gagtaaacgg ctaggctaga ggtggctaga ataaatagga 240
gg 242

<210> 723
<211> 472
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(472)
<223> n = A,T,C or G

<400> 723
cctactatgg gtgttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga 60
gccgttcctc tttggactaa cagttaaatt tacaagggga tttagagggt tctgtgggca 120
aatttaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggt 180
ttgtcgcctc nacctataaa tcttcccact attttgctac atagacgggt gtgctctttt 240
agctgttctt aggtagctcg tctggnttcg gggtcttag ctttggctct ccttgcaaag 300
ttatttctag ttaattcatt atgcagaagg tatagggggtt agtccttgct atattatgct 360
tggttataat tttcatctt tcccttgcgg tactatatct attgcgccag gtttcaattt 420
ctatcgccta tactttattt gggtaaatgg tttggctaan gttgtctggt ag 472

<210> 724
<211> 292
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(292)
<223> n = A,T,C or G

<400> 724
nccaccactg cagccctaca tacagntgaa aaaaaattcc attctgttaa catttgtttt 60
ataagttttc acncaataca caaaaaaccc ctctgcactt cttgtaaaga acaaaaaaga 120
tacacaacag ttaagcgtaa agatcacagg caatagcatt caaacatgga tgtgggnaga 180
gaaaggagta cctggcatga gtacctgctt agttngactg aatccttgat ttttaatttg 240
gcttttcatg ggccgntcac aacaccaacg ctgngngagg tatggtagtc ag 292

<210> 725
<211> 122
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(122)
<223> n = A,T,C or G

<400> 725
atagaaaggg catacccaaa atgttactga aaatntaata caaattccaa gattcaccaa 60
ngaagtaaca aaaacctggc ctgcangngg ncccctatcc cgtggctcca tggntgatgt 120
gg 122

<210> 726
<211> 477
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(477)
<223> n = A,T,C or G

<400> 726
ctgaaccctc gtggagccat tcatacaggt ccctaattaa ggaacaagtg attatgctac 60
ctttgcacgg ttagggtacc gcggccgtta aacatgtgtc actgggcagg cggtgcctct 120
aatactggtg atgctagagg tgatgttttt ggtaaacagg cggggtaaga tttgccgagt 180
tccttttact ttttttaacc tttccttatg agcatgcctg tgttgggttg acagtgaggg 240
taataatgac ttgttggtga ttgtanatat tgggctgtta attgtcagtt cagtgtttta 300
atctgacgca ggcttatgcg gaggagaatg ttttcatgtt acttatacta acattagttc 360
ttctataggg tgatagattg gtccaattgg gtgtgaggag ttcagttata tgtttgggat 420
tttttaggta gtgggtgttg agcttgaacg ctttcttaat tggcggctgc ttttagg 477

<210> 727
<211> 416
<212> DNA
<213> Homo sapien

<400> 727
cctgtctttg aatggatgaa ataggttaat aaaaaacatc actgtttaaa aactagaaca 60
ctgaaaaatt ctaggaaagc ttattttccc ttatattttt atggtacttt caacacttaa 120
taacactatt tcaattaagt tttctcctag agtttatagt atatcagtac attcttttct 180
gtggatgcaa taatatagaa tcttattcca aatcttactg gcaggttctc ttaaattctt 240
caacggctgc catagtgatt aaccaaaatt agttatgatt tctgcctatc tgtgtgagaa 300
cttacagggg aaattgttct aaacctgagg aacatgaagt aactgtactg cacactccaa 360

atgatgacag tcattttata tcaccttcaa ttacccaaca gcttttaata gtctgg 416

<210> 728
<211> 416
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(416)
<223> n = A,T,C or G

<400> 728
cctgtctttg aatggatgaa ataggttaat aaaaaacatc actgtttaaa aactagaaca 60
ctgaaaaatt ctaggaaagc ttattttccc ttatattttt atggtacttt caacacttaa 120
taacactatt tcaattaagt tttctcctag agtttatagt atatcagtac attcttttct 180
gtggatgcaa taatatagaa tcttattcca aatcttactg gcaggttctc ttaaattctt 240
caacggctgc catagtgatt aaccaaaatt agttatgatt tctgcctatc tgtgtgagaa 300
cttacagggg aaattgttct aaacctgagg aacatgaagt aactgtactg cacactccaa 360
atgatgacag tcattttata tcaccttcaa ttacccaaca gcttttaata ntctgg 416

<210> 729
<211> 564
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(564)
<223> n = A,T,C or G

<400> 729
ctgtgagtag aggagtcttc ccgagagtag cagttgttga tccaaatgat tgaagccttc 60
aggtaaggga ataactgctg caggaattct ttcttgaaga atttaagctg tttggtaaga 120
attctgtaac tacatacctt tgaaacacta ttcacattca aataaacgct tgttttctag 180
ccaggcacag gctcaattag tttttcaaac tctagccaag gcagtatttc atttgggaaa 240
tcatgcaaca gaactgctca attcttaact tctcctgctg ttaacattta cacttagact 300
gccagcaaca gttaacttaa attttggtct caagggaaca aaaaaaaatt gcattcagaa 360
tttaatatag tattttaaaa ctaattttag cctgtaagnc attatgagca atagtaactt 420
ttatacctcc tcatcttgnc tgataatata ttctatatgc tgncaatctg attatatagt 480
ctatatgcta gaagttgctg attttcattc tgccaccaaa aaaaactgtc cttttttttt 540
tatgggggaa aaagggaatt taaa 564

<210> 730
<211> 310
<212> DNA
<213> Homo sapien

<400> 730
ccatttttat ttcttcttca gagaagtgtt tatttaggtc tgttgcccat tttacaatta 60
ggccatatgt tttcttgctg ttgagttgta tgtgtgtttg tataaatttt gcatattaac 120
cccttatcac acgtatgttt tttaaaataa attttgctta ttaatctttt atcagatgta 180
tggtttccaa atatattctt ccgatccatg gattctcttt tttgttatga ttgtttcttt 240
gctcttcgga agctttttgt tttgttttgt tatttgtttt actttgatat agtcccattt 300
attgtttttg 310

<210> 731
<211> 467
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(467)
<223> n = A,T,C or G

<400> 731
ngacaacctt agccaaacca tttacccaaa taaagtatag gcgatagaaa ttgaaacctg 60
gcgcaataga tatagtaccg caagggaaag atgaaaaatt ataaccaagc ataataaagc 120
aaggactaac ccctatacct tctgcataat gaattaacta gaaataactt tgcaaggaga 180
gccaaagcta agacccccga aaccagacga gctacctaag aacagctaaa agagcacacc 240
cgtctatgta gcaaaatagn gggaagattt ataggnagag gcgacaaacc taccgagcct 300
ggtgatagct ggttgtccaa gatagaatct tagntcaact ttaaatttgc ccacagaacc 360
ctctaaatcc ccttgtaaat ttaactgnta gnccaaagag gaacagntct ttggacacta 420
ggaaaaaacc ttgtagagag agtaaaaaat ttaacaccca tagtagg 467

<210> 732
<211> 492
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(492)
<223> n = A,T,C or G

<400> 732
cctactatgg gtgttaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga 60
gctgttcctc tttggactaa cagctaaatt tacaagggga tttagagggt tctgtgggca 120
aatttaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggt 180
ttgtcgcctc tacctataaa tcttcccact attttgctac atagacgggt gtgctctttt 240
agctgttctt aggtagctcg tctggnttcg gggtcttag ctttggctct ccttgcaaag 300
ttatttctag ttaattcatt atgcagaagg tataggggtt agnccttgct atattatgct 360
tggntataat ttttcatctt tcccttgcgg tactatatct attgcgccag gtttcaattt 420
ctatcgccta tactttattt gggtaaatgg tttggctaag gttgtctggt agtgaggcgg 480
agngggtttg gg 492

<210> 733
<211> 562
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(562)
<223> n = A,T,C or G

<400> 733
ntgaaatggc aatagcattc actgtcgtat tttgcagtgc tcaggaagtg ggacgttaac 60
tttgaaggtg cttgtttgta ttagctctgc taggtttacc tctacaacgt agatttcagc 120

agctatgctg actgacacta cattctagtt cttaagattt tttttccana tcccccccttc 180
cccagctaga catacgtagc atactttcat cttattcagt ctttctgtaa cctgctgctg 240
cttttagtcc tcctcacctc agatcggaat caatggagtg ggcccagagg atacatttta 300
attccagtaa tggtaggtag atttgtcctg ctttctaaaa catctcctca tttcatattt 360
ccactccata ttgattccat aagggaaaat taatgggtgn ttcctccttt agggaggcaa 420
tgcaaagagn gtggacatct [illegible] [illegible] gttgatttcc cttgaaggag 480
cttacatatt gactgtnttt cacaataacc tgnttgcccc agntcaatcc ctcattttaa 540
tacttaatgt tggtnctggg ct 562

<210> 734
<211> 265
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(265)
<223> n = A,T,C or G

<400> 734
nggtccagaa caagagaaat aactgcagaa aacacatatg gttggaaacc atgcgcttgt 60
gactttttct gtagcctatg ggagtggaca gagtgggtaa cccaagatgt ttttaagact 120
gactggacta agaatggcgt acttatagcc aactacttcc cccctaatgt gactgaaggg 180
attcataatg atcacaatta gcattacggt taagtatttt agggttgacg tctaagctca 240
cacttgaaag gtatttatct aatgg 265

<210> 735
<211> 216
<212> DNA
<213> Homo sapien

<400> 735
atttaatacg tgctcactgc tcggcacgcg ctgaagctac agttaacaat cagtgagcac 60
atattaaatg ataaaataat gctgatggta aacattcata acagcagagt aagattttgg 120
cagttttgtg tctcggtaac ataactgtaa ccttagatga acacctatcc cttcatgatc 180
tgactttaga ggcaaggagt ttgtaacatc taatgg 216

<210> 736
<211> 285
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(285)
<223> n = A,T,C or G

<400> 736
ctgaaaggca acntggagac tagttagtct agtcccctca tattataaat tggtatgctg 60
aggccaggca gtaaattgct atggagctct ccaatttaag gccagtttga ctccaagggt 120
agggcttcta gtaaaatttt gtgattaaat tggaaactct aatttatttt tctatgngtt 180
tttggtacct aatcctcata agcaagccat atttcaaggc tgatcaatga aaacaccaaa 240
taccaaagct tcctttccct tccaaattta ctgacccttt gtcag 285

<210> 737

<211> 509
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(509)
<223> n = A,T,C or G

<400> 737
agangaagaa gangaagatt aagggaaaag tacatcggtc aagaagagct caacaaaaca 60
aagcccatct ggaccagaaa tcccgacgat attactaatg aggagtacgg agaattctat 120
aagagcttga ccaatgactg ggaagatcac ttggcagtga agcatttttc agttgaagga 180
cagttggaat tcagagccct tctatttgtc ccacgacgtg ctcctttga tctgtttgaa 240
aacagaaaga aaaagaacaa catcaaattg tatgtacgca gagttttcat catggataac 300
tgngaggagc taatccctga atatctgaac ttcattagag gggtggnaga ctcggaggat 360
ctccctctaa acatatcccg tgagatgttg caacaaagca aaattttgaa agttatcang 420
aagaatttgg gtcaaaaaat gcttanaact ctttactgaa ctggcggaag atnaagagaa 480
ctncaagana ttctatgagc agntctctt 509

<210> 738
<211> 97
<212> DNA
<213> Homo sapien

<400> 738
cagtgaattg aatacgactc ctatagggcg aattgggccc tctagatgca tgctcgagcg 60
gccgccagtg tgatggatat ctgcagaatt cgcccctt 97

<210> 739
<211> 209
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(209)
<223> n = A,T,C or G

<400> 739
ccgncagtgt gatggatatc tgcagaattc gcccttagcg gcccgcccgg gcagggtcct 60
tatatatagt agcttagttt gaaaaaatgt gaaggacttt cgtaacggaa gtaattcaag 120
atcaagagta attaccaact taatgttttt gcattggact ttgagttaag attatttttt 180
aaatcctgag gactagcatt aattgacgg 209

<210> 740
<211> 164
<212> DNA
<213> Homo sapien

<400> 740
ccaagctaat gggtgacact gtgaatgcaa ctctaatgca gcctggcgta aatggtccta 60
tgggcactaa ctttcaagtt aacacaaaca gaggaggtgg tgtgtgggaa tctggtgcag 120
caaactccca gagtacatca tggggaagtg gaaatggcgc aaat 164

<210> 741
<211> 514
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(514)
<223> n = A,T,C or G

<400> 741
ccagtcagaa ttgagatgtg ctgtgagtgc aaaatacact caaatctaag acttagtatg 60
gaagaaaaag aagataaggt gnttcattaa taatctttta tattgattac atgttgaaat 120
gatattttta atatactggg ttacataaac tgttattaag attaattttg cttgtttctt 180
ttttaatatg gctactagaa aattaaaaat tatgttgtgg ttcacattat atttctgttg 240
aacaatgtgg acatagataa tctacagtca ttacattagc cttagaattt agcatcatac 300
ttttaagtac tctggggtac taacttgaac tcccagaaac ccataagcac actctgcata 360
taaattattg caaaattcat tcttatctct ctgaaagata tgcattttaa gggtaaaaag 420
aattcacaaa atattgantc cttaacaaat gtcaattagt atatggagag agctaaagga 480
cttcntgtag actggtncat tggggaaaaa caga 514

<210> 742
<211> 439
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(439)
<223> n = A,T,C or G

<400> 742
gcaggtccta tgcatagtta ataagggnta taatctactc aacatggaaa atgggagcct 60
atttgcaaac acacgagtaa ttaaagtacc aattctctct tagtttcttt ttttatagtt 120
ggnttatttt gcaattataa atgntaaaca tccctagaga tgaaagttaa aatggctgat 180
cacagattag tagcaaaata caaattgaca attcaaaatt ataaataaaa ctctgttgag 240
gatgtttaac tttgagcctc caaatttaag agctaagctt ggaagaaaca aatttatagg 300
ttatatttcc ctcttaaatt aaaaaacaaa cttcctctgg cagtagnttg tgaattcctt 360
tcattgnaat gataccatga ttacaggatc aaaaatgctt aacttacttg ccattctgct 420
cacatcatca cagttgttt 439

<210> 743
<211> 275
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(275)
<223> n = A,T,C or G

<400> 743
cangacgcta cttcccctat catagaagag cttatcacct ttcatgatca cgccctcata 60
gtcattttcc ttatctgctc cctagtcctg tatgcccttt tcctaacact cacaacaaaa 120
ctaactaata ctaacatctc agacgctcag gaaatagaaa ccgtctgaac tatcctgccc 180

gccatcatcc tagtcctcat cgccctccca tccctacgca tcctttacat aacagacgag 240
gtcaacgatc cctcccttac catcaaatca attgg 275

<210> 744
<211> 295
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(295)
<223> n = A,T,C or G

<400> 744
ctgtnctttt aaaaaatctg gatgtttttt atttagtgat tgttcgacaa ttagctgctt 60
caaaacataa tgtgcattgc ttatgaatgc cttcatatac taatacagat actctgataa 120
tattacactc taataaggat aatgctgaat tttgaaagga cacaaaacat ctaatgccaa 180
tatatacatg attagccaac atctttgcta tcaagaccac tcgtttttaa ataaagatgc 240
aagtgtcagt tgtagattat tgggatgaag ctaaatcccc agaatgcagc agcag 295

<210> 745
<211> 477
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(477)
<223> n = A,T,C or G

<400> 745
cgcgttactg tacatattgc tagcaggaga caactggaaa tactaaacaa atactggaat 60
tcacattaca gacagacgaa accaacatgg atgccacaca taacttcctt tgtagtttca 120
cagagagcct atttgtggtt gctcaggtgg ggtcatacat tgcttgcaga aatggcctga 180
tcatagctct atgaaacaat gaattcggaa tgaaatctta ccatgacacc tctctgtagg 240
aaagaaatgt tgcttcacgt gtgctaagtt gagataataa tatttcacat atttatatac 300
agagaatcac tctcaaattt aacccaagat aagcaatagg atttgggggt gacttgtaca 360
catttctaac aacacttttc tttttctag aggtcactct caaacactga tatatcacta 420
tagtttgagt gtanggattc agtaatcaaa ggttgttatt gcaaaagagc caggcag 477

<210> 746
<211> 524
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(524)
<223> n = A,T,C or G

<400> 746
ctgtgaaatt gggttgggag agccaaaata ctttacaact tcagaccgga gaaaaggcca 60
gaggtgtgaa gttagactct atgatgaaac agagtcgtct tttgcgatga catgttggga 120
taatgaatcc attctacttg cacagagctg gatgccacga gaaacagtaa tatttgcctc 180
agatgtaaga ataaattttg acaaatttcg gaactgcatg acagcaactg taatctcaaa 240

aaccattatt acaactaatc cagatatacc agaagctaac attctgctga attttatacg 300
agaaaataaa gaaacaaatg ttctggatga tgaaattgac agttatttca aagaatccat 360
aaatttaagt acaatagttg atgtctacac agntgaacaa ttaaagggaa aagctttgaa 420
gaatgaagga aaagctgatc cttcctatgg catcctttat gcctacattt ccacactcaa 480
cattgatgat gaaactcaaa agtagttcga aatagatgtt ccag 524

<210> 747
<211> 456
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(456)
<223> n = A,T,C or G

<400> 747
cctcagttct tgattgtggt tgacggggcg tcaccatgaa ggagcccatt tagtataaag 60
cttccaacct tttctcttaa tcgtttcttt aatcttttaa accatcttca agtgcatagg 120
ggagtttccg atgccagagg atgaaagcaa gtgctttctc caccctctcc tcccagagtg 180
aaaacaaatc cttttgctga tacttgtttc aaaagcatcc attgtaaagc ttctcagtga 240
cacaaaatac tgagaggtaa ctttttatca atcaaaccac ataccccaat ttaacacctt 300
tcagtgctct gaattcaact gacagactaa agggtgtttc ctgtaacagt ctgaaatatt 360
aagtgttttt tttgttttgt ttttaaatct tatttcagaa aacttcctct nggggtagga 420
aagtacacat gaagcagcaa agtaacgaag aaaaac 456

<210> 748
<211> 474
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(474)
<223> n = A,T,C or G

<400> 748
ccanaccagg gaaccaaatg cagacagnga agttctctgc ttcttttggc tataatgnga 60
caagaaaggg atcatctttt gaagatgttt aaagaaataa agcaactttc tttataaaca 120
gtcaaataat caattaatgg aataaataag tactaaccca cattttaacc actctgtaat 180
cactacactt tacatatttt ttatttnggn ggcaaantcc cccataatta gtctaaaatc 240
caccaatcac ttttaaaagt aaaatgaata gccaccaaaa taagaaaatc ttctgttcac 300
tctttggcta aaaaggaaaa caaataaaac aaaacaaaaa gaaacagaag acaactgtaa 360
cactggtgat aaaagaaact ttttttttac aagtaaaata aagttatcaa tttaaatctt 420
ggncacttta taaaaacaag aggtaatgtt gtaataaaac agcagtagcc tcag 474

<210> 749
<211> 355
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(355)
<223> n = A,T,C or G

<400> 749
cctgggtnna gnggctgact gnaacctcca cttcctgttc tcaggcaatc ctcctgcctc 60
agcctcctta gtagctggga ctacaggagt gtgcaaccat gcccaactaa tttttgtatt 120
tttaatagag acagggtttc accatgttga tcaggttggt ctccaactcc tgacctcagg 180
tgatccacct gtcccagcct cccaaagtgc tgggattaca ggcatgagcc accacgcccg 240
gnccaggata aagtaaaaat ttgtaagcac acaaggccct ttgcaacctg gctcctggtt 300
actactttaa ncctcctgcc ctcccaaatg tnctcactgt ttttctanac atacc 355

<210> 750
<211> 493
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(493)
<223> n = A,T,C or G

<400> 750
ccatgctggt ctcgaactcc tgaactcagg tgatccaccc gcctcagtct cccaatagat 60
tacatatatt attaatgaat tgcttccttt aacaccctat tcattgaatt ttccagtaaa 120
ccacaattac taattactcc tgaaatcaga aaagaggtta aaaagatttt ataacagtat 180
cctatgaaat ctactacttt caagtaatag tagttgaatt accaaaaccc gtcactcaag 240
ccaatgacta caattaagat atgagtaaca tttcctagat aaataaagtc aattaattat 300
atttgcatct gggaaataga gaaagtacat ataagccatg attttgaagn caaaagagag 360
agantatttg ccaaggaggg gtgagttata gtatgtaatt ataacataca gaagcttttt 420
gtatgctggt aactaatttt aatttcctac attnttatgg agatttctgc tattcttgtc 480
ctattttcca cct 493

<210> 751
<211> 364
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(364)
<223> n = A,T,C or G

<400> 751
cgaggtctgg naaggtcacc aagtctgccc aganagctca gaaggctaaa tgaatattat 60
ccctaatacc tgccacccca ctcttaatca gtggtggaag aacggtctca gaactgtttg 120
tttcaattgg ccatttaagt ttagtagtaa aagactggtt aatgataaca atgcatcgta 180
aaaccttcag aaggaaagga gaatgttttg nggaccactt tggttttctt ttttgcgtgt 240
ggcagtttta agttattagt ttttaaaatc agtacttttt aatggaaaca acttgaccaa 300
aaatttgtca cagaattttg agacccatta aaaaagttaa atgagataaa aaaaaaaaan 360
cntg 364

<210> 752
<211> 498
<212> DNA
<213> Homo sapien

<220>

<221> misc_feature
<222> (1)...(498)
<223> n = A,T,C or G

<400> 752
ctggattatg ggttggnatt ggccatatgt [illegible] aaaggaatag gtatgatgca 60
gtgaatccct tagaagttac aattctcaaa ttacatactt cctcagatgt aacattagaa 120
ctcaatattt ctaacaataa cataccagaa aaggctggac tggcactcat ctgctgacta 180
acttgtagcc tcagtaatat gacatacttg cctttaacaa attatctcaa attaactaac 240
agaccttcag aaaatggaga ttctttttga tggggacata atcaaattta agtctgagaa 300
atatgcttaa cagttggaac tcaaattaaa tgtactgatt ttaaagttta gacattaaca 360
agtgatanat tagcctcaaa aaaagacaat ttggnaaggn ttaggtcttt taatttggtg 420
cttgntcaca acttgactgg tgcttctttc cttgctgctt cacatcaagc atggggccaa 480
ttctattttc agtaaatg 498

<210> 753
<211> 467
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(467)
<223> n = A,T,C or G

<400> 753
nacaacctta gccanaacca tttacccaaa taaagggata ggcgatagaa attgaaacct 60
ggcgcaatag atatagnacc gcaagggaaa gatgaaaaat tataaccaag cataatatag 120
caaggactaa cccctatacc ttctgcataa tgaattaact agaaataact ttgcaaggag 180
agccaaagct aagaccccccg aaaccagacg agctatctaa gaacagctaa aagagcacac 240
ccgtctatgt agcaaaatag tgggaagatt tataggtaga ggcgacaaac ctaccgagcc 300
tggtgatagc tggntgncca agatagaatc ttagntcaac tttaaatttg cccacagaac 360
cctctaaatc cccttgtaaa tttaactgtt agtccaaaga ggaacagctc ttggacacna 420
ggaaaaaacc ttgcagagag agtaaaaaat ttaacaccca tagtagg 467

<210> 754
<211> 196
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(196)
<223> n = A,T,C or G

<400> 754
gtcatgttca agtgttntaa tctgacgcag gcttatgcgg aggagaatgt tttcatgtta 60
cttatactaa cattagttct tctatagggt gatagattgg tccaattggg tgtgaggagt 120
tcagttatat gtttgggatt ttttaggcag tgggtgttga gcttgaacgc tttcttaatt 180
ggtggctgct tttagg 196

<210> 755
<211> 381
<212> DNA
<213> Homo sapien

<400> 755
ctggaaagga ttctgtacat ataagacatc aaatattgag ggatactgga acttttaaat 60
taatgggcaa agaaagtcaa caaaggaagt tcatatgaaa tcaaactagt aatatgatta 120
caaaaaaaaa gtttaaaatt tttcttggcc ccagtcttat catttctgag ccaaatacaa 180
ttctatcgaa atcacctgaa actgaaatca ccattctagg ctggttttcc cataaagatg 240
gactgctcca aaaagaggaa tcaagaaaga atttggctca cagtgaatta ttcactttgt 300
cttagttaac taaaaataaa atctgactgt taactacaga aatcatttca aattctgtgg 360
tgataataaa gtaatgaccg c 381

<210> 756
<211> 341
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(341)
<223> n = A,T,C or G

<400> 756
ggntataaac ctattattta ttgcagaact aataaaaaat ccaaagcctt gtatttgtac 60
atctttatta tctctaaagc actttcctca acctaatttc agtttttaca attggtactc 120
aagaaaatag agacagaaat catttgattt tgcccagaaa ccatctgctt atatttataa 180
ggccacctaa tttgaaatca catatagacc aggcgcggtg gctcacgcct gtaattccaa 240
cactttggaa ggccaaggca ggtggatcac aaggtcaaga gattgagacc atcttggcca 300
acatggcgaa accccgtctc taccaaaaat acaaaaatca g 341

<210> 757
<211> 479
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(479)
<223> n = A,T,C or G

<400> 757
cgcnttactg tacatattgc tagcagggag acaactggaa atactaaaca aatactggaa 60
ttcacattac agacagacga aaccaacatg gatgccacac ataacttcct ttgtagtttc 120
acagagagcc tatttgtggt tgctcaggtg gggtcataca ttgcttgcag aaatggcctg 180
atcatagctc tatgaaacaa tgaattcgga atgaaatctt accatgacac ctctctgtag 240
gaaagaaatg ttgcttcacg tgtgctaagt tgagataata atatttcaca tatttatata 300
cagagaatca ctctcaaatt taacccaaga taagcaatag gatttggggg tgacttgtnc 360
acatttctaa caacactttt ctttttcta gaggtcactc tcaaacactg atatatcact 420
atagnttgag ngtagggatt caagtaatca aaggttgtta ttgcaaaaga gccaggcag 479

<210> 758
<211> 267
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature

<222> (1)...(267)
<223> n = A,T,C or G

<400> 758
ccatgnctag gtttatagat agttgggtgg gttggtgtaa atgagtgagg caggagtccg 60
aggaggttag ttgtggcaat aaaaatgatt aaggat[illegible] [illegible] [illegible] 120
cctttagtgt tgtgtatggc tatcatttgt tttgaggtta gtttgactag tcattgttgg 180
gtggtaatta gtcggttgtt gatgagatat ttggaggtgg ggatcaatag agggggaaat 240
agaatgatca gtactgcggc gggtagg 267

<210> 759
<211> 449
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(449)
<223> n = A,T,C or G

<400> 759
cgaggtcttg aaatcagcaa cacacttaca aatgagaaaa tgaaaataga agagtatata 60
aagaaaggga aagaggatta tgaagagagt catcagagag ctgtggctgc agaggtatcc 120
gtacttgaaa actggaagga gagtgaagtg tataagctac agatcatgga gtcacaagca 180
gaagcctttc tgaagaagct ggggctgatt agccgtgatc ctgcagcata tcccgacatg 240
gagtctgata tacgttcatg ggaattgttt ctttctaatg ttacaaaaga aattgagaaa 300
gcaaagtctc agtttgaaga acaaattaag gcaattaaaa atggttcccg gctcagtgaa 360
ctttctaaag ngcagatttc tgagctttca tttcctgcct gtaacacggt tcatcccgag 420
ttactccctg agtcttcagg ccacgatgg 449

<210> 760
<211> 414
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(414)
<223> n = A,T,C or G

<400> 760
ccatnaactg gaagcagctc actaaacaaa cagnggcata cccatagaac tgcatacttc 60
tcagcagtat gaaagaatga gctacttata taagcatcat tgataaacct caaaaaaaaa 120
atgccacatg aagaanccca agggggagaa acataaaaac tttatatgnc agncatataa 180
aattctagaa aatgcaaact aatccatcnt aaaggaaagt aaatcancag ttgtctggag 240
gaccanagag agcaggagga gagagattnt taanggggtt aaagtaaatt ngggagtgcc 300
cttccatttt taaatnctat gaaaatgaaa gtaaaggccc ntgcatgttg taaactaata 360
gtaacaaaca gattgggttg gagtggggtg ttgtctgggg acatcattac aaan 414

<210> 761
<211> 428
<212> DNA
<213> Homo sapien

<400> 761

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gagcctcact aaaataacag atttcagtat agccaagttc atcagaaaga ctcaaatgga     60
atgatttaca agatagaaca ctttaaacca ggtcagtcct atcttttgt agctgaaggc      120
tatcagtcat aacacaattt cgcgtacacc tctgctcatt atggaattac acttaaaacg     180
aatctcaaga gggtgaccat tgttgtttca gataccatcc ctaaggagag tggttaacag     240
gaagattgcc agtgttactg atggaaagaa gtgtttgttt gttttttttc ttgtcaaaga     300
cttacaccat agttttaaat taaactgtca ggcattttct cagacaggtt ttccttttca     360
atgcagtaat gaagaactaa gataaaaatc atgacttttg actgccactc aacattatta     420
catgcacc                                                              428

      <210> 762
      <211> 574
      <212> DNA
      <213> Homo sapien

      <220>
      <221> misc_feature
      <222> (1)...(574)
      <223> n = A,T,C or G

      <400> 762
caggtctgaa ctgataagta ttaagagacg tttgttgcta gttaagngtt ccagttgaga     60
gttcgaagtg aaaacctggg ctctttacca gtgttgagtg agaagattta tttctctttc     120
ctctgaattt accacatgta acatcacaga gacatgtaga gttcctttag gatttgcgat     180
ttgaaccagn ccagtctgat tttcaggtga attctgtgaa gagcttgatg ggggaagtct     240
gaagacagaa ggaattaggg aaaagggtga tacttacaga gtaaaggaaa taaatgaaaa     300
gataatggta tttttggtag ccacagggaa atagcaggag gggactggag atcacacaca     360
cgcacacgca cacacacaaa cacacacaca cgctaaaact caaactaaaa acctcccaaa     420
ggagctgctt tgtttgcaga cttcaattng aagtagatac taagggcaag aatagaccag     480
ttaaaattca cctgaaaatc tcttcccann cttcaaatgt gctaaaatat cactgtcagc     540
ttagcatctc tncatgtatg tatatataga tgta                                 574

      <210> 763
      <211> 465
      <212> DNA
      <213> Homo sapien

      <220>
      <221> misc_feature
      <222> (1)...(465)
      <223> n = A,T,C or G

      <400> 763
cctactatgg gtgttaaaat tttttactct ctctacaagg ntttttccta gtgtccaaag     60
agctgttcct ctttggacta acagttaaat ttacaagggg atttagaggg ttctgngggc     120
aaatttaaag ttgaactaag attctatctt ggacaaccag ctatcaccag gctcggtagg     180
tttgtcgcct ctacctataa atcttcccac tattttgcta catagacggg tgtgctcttt     240
tagctgttct taggtagctc gtctggtttc gggggtctta gctttggctc tccttgcaaa     300
gttatttcta gttaattcat tatgcagaag gtatagggt tagtccttgc tatattatgc      360
ttggatataa tttttcatct ttcccttgcg gtactatatc tattgcgcca ngtttcaatt     420
tctatcgcct atactttatt tgggtaaatg gtttggctaa ggttg                     465

      <210> 764
      <211> 151
      <212> DNA
      <213> Homo sapien
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<400> 764
ctgtcaatta atgctagtcc tcaggattta aaaaataatc ttaactcaaa gtccaatgca 60
aaaacattaa gttggtaatt actcttgatc ttgaattact tccgttacga aagtccttca 120
catttttcaa actaagctac tatatttaag g 151

<210> 765
<211> 251
<212> DNA
<213> Homo sapien

<400> 765
gaagagctta tcacctttca tgatcacgcc ctcatagtca ttttccttat ctgcttccta 60
gtcctgtatg cccttttcct aacactcaca acaaaactaa ctaatactaa catctcagac 120
gctcaggaaa tagtaaccgt ctgaactatc ctgcccgcca tcatcctagt cctcatcgcc 180
ctcccatccc tacgcatcct ttacataaca gacgaggtca acgatccctc ccttaccatc 240
aaatcaattg g 251

<210> 766
<211> 375
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(375)
<223> n = A,T,C or G

<400> 766
cgaggtctgn cctcctggtt cttcatccat tattaacaga agagcatact ggtttcggtc 60
cataaaatct ttgggaaggg acaactgtaa aggaagttca tagtcgtcaa tatgaaggat 120
tttaatttct ggctttccta tcttcttctt caggatagct tccttcagca tagaattgtt 180
ttccaatata aaatattttg ctgggttgtc cgtactatgt aggctgacca ctgggacccct 240
tggaccttca cagaataata agaaatgttg attcatggga ctaaaactgg catcaaaata 300
tgtacattgt tctttcatga aattacatga aatgcattgg cgattcaata atccttcagt 360
agaagcactg tacag 375

<210> 767
<211> 485
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(485)
<223> n = A,T,C or G

<400> 767
cgaggtctga accctcgtgg agccattcat acaggtccct aattaaggaa caagtgatta 60
tgctaccttn gcacggttag ggtaccgcgg cccgttaaac atgtgtcact gggcaggcgg 120
tgcctctaat actggtgatg ctagaggtga tgtttttggn aaacaggcgg ggtaagattt 180
gccgagttcc ttttactttt tttaaccttt ccttatgagc atgcctgtgt tgggttgaca 240
gtgagggtaa taatgacttg ttggtgattg tagatattgg gctgttaatt gtcagttcag 300
tgttttaatc tgacgcaggc ttatgcggag gagaatgttt tcatgttact tatactaaca 360
ttagttcttc tatagggtga tagatnggtc caattgggtg tgaggagntc acttatatgt 420

ttgggatttt ttaggtaagn gggtgttgag cttgaacgct ttcttaattg ggggctgctt 480
ttang 485

<210> 768
<211> 379
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(379)
<223> n = A,T,C or G

<400> 768
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acaactgaaa aggtggaatt tctccctaat tcattttagg aggccagcat tatactgata 120
ccaaaacctg gcagaggtac aataataaaa ggaaacttca agtcagtatc actgatgaac 180
accaatgtga aaatcctcaa taaaatactg gcaaactgaa ttcagcagca catcaaaaag 240
ctaatccacc acaatcaagt cagcttcatc cctgcgatgc aagtctggtt caacatatgc 300
aaatcaataa atacaattca tcagataaac agagctaaag acaaaattca catgattttc 360
tcaatagatg cagaaaagg 379

<210> 769
<211> 518
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(518)
<223> n = A,T,C or G

<400> 769
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atatgggtag aatatagtca atatgaatgg aatagacaat gctttgaaaa tcactggagg 120
gaggctttat tgtttgtgaa aacatgttgt catcactttt tgctttaagc ccttggtggt 180
gaaataactc aaaccattct tccttatgct gaagatcgag aacccccaagt atcacatcta 240
ccatcccact catcaatgtg attggtcagt ctttgctgag gncctgcata gccagtttta 300
aagttagagt tcttgcatat acatatgaaa aggcatgtta cttgtgcttt caaagagctt 360
tttgcttggt gtaaaaagaa aactcaaatt acagtgtgat gtggaatata atggtggtag 420
tttcatcgag atgatgggaa agaattgata agataaagcn gaaagatgag cagaattttc 480
agattgggtn tggaaagagc acttaagaaa gagggtgg 518

<210> 770
<211> 378
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(378)
<223> n = A,T,C or G

<400> 770
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cacactttat aaaactttga attcttgaaa tgggtttcag aggttccaag gtcaaattca 120
agaataagag ttaagaagaa aaagactatg agaaaggaag tgntgacccc atttgcattt 180
aaatggcagg aatagtctca atctactcat tggggaaaaa tgtatgttgc atatttttga 240
gatattgcaa cttgctctct ctctttgcca ccccaccctt tgncatgctc tgtttttggg 300
ctgaattggc aagaaaaatg gctggagggc tggaagaagn tggacccttc ttccttcttc 360
[illegible] 378

<210> 771
<211> 207
<212> DNA
<213> Homo sapien

<400> 771
cataaatatt atactagcat ttaccatctc acttctagga atactagtat atcgctcaca 60
cctcatatcc tccctactat gcctagaagg aataatacta tcactgttca ttatagctac 120
tctcataacc ctcaacaccc actccctctt agccaatatt gtgcctattg ccatactagt 180
ctttgccgcc tgcgaagcag cggtagg 207

<210> 772
<211> 384
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(384)
<223> n = A,T,C or G

<400> 772
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gctgttcctc tttggactaa cagttaaatt tacaagggga tttagagggt tctgngggca 120
aatttaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggt 180
ttgtcgcctc tacctataaa tcttcccact attttgctac atagacgggt gtgctctttt 240
agctgttctt aggtagctcg tctggtttcg ggggtcttag ctttggctct ccttgcaaag 300
ttatttctag ttaattcatt atgcagaagg tataggggtt agtccttgct atattatgct 360
tggttataat ttttcatctt tccc 384

<210> 773
<211> 182
<212> DNA
<213> Homo sapien

<400> 773
ccctttttcct aacactcaca acaaaactaa ctaatactaa catctcagac gctcagggaa 60
atagaaaccg tctgaactat cctgcccgcc atcatcctag tcctcatcgc cctcccatcc 120
ctacgcatcc tttacataac agacgaggtc aacgatccct cccttaccat caaatcaatt 180
gg 182

<210> 774
<211> 191
<212> DNA
<213> Homo sapien

<400> 774
ccatggctag gtttatagat agttgggtgg ttgggtgtaa atgagtgagg caggagtccg 60

aggaggttag ttgtggcaat aaaaatgatt aaggatacta gtataagaga tcaggttcgt 120
cctttagtgt tgtgtatggc tatcatttgt tttgaggtta gtttgattag tcattgttgg 180
gtggtaatta g 191

<210> 775
<211> 192
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(192)
<223> n = A,T,C or G

<400> 775
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angaggttag ttgaggcaat aaaaatgatn aaggatacta gtataagaga tcangttcgt 120
cctttacatg ttgngtatgg ctatcatttg ttttgaggct agnttgatta gtcattgttg 180
ggtggtaatt aa 192

<210> 776
<211> 144
<212> DNA
<213> Homo sapien

<400> 776
ctgacccccct agaaccctgg ctctgccatt agctaggacc taagactctg cccacatttt 60
ggtctgttct ctcccattac acataggttt gtctcagcat gcaagagttt ttcctttaaa 120
aaaaaaaaaa aaaaaaaaaa aaaa 144

<210> 777
<211> 483
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(483)
<223> n = A,T,C or G

<400> 777
cctactatgg gtgntaaatt ttttactctc tctacaaggt tttttcctag tgtccaaaga 60
gctgttcctc tttggactaa cagttaagtt tacaagggga tttagagggt tctgtggca 120
aatttaaagt tgaactaaga ttctatcttg gacaaccagc tatcaccagg ctcggtaggt 180
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ttggatataa tttttcatct ttcccttgcg gtactatatc tattgcgcca ggtttcaatt 420
tctgccgcct atactttatt tgggtaaatg gtttggctaa ngttgctggt agaaggtgga 480
gtg 483

<210> 778
<211> 393
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(393)
<223> n = A,T,C or G

<400> 778
ctgcattttt attgcgatct gcagatgaac tgggaaaatc tcattttaca acagaactga 60
gacagacgac caccatattc actgaggtct aaatttgcag tttccactaa tgacattttg 120
atttcccaac agagatactt ctggtcttac tgcacagtct tttaagagaa atacttccat 180
tatgccacat tgtccttgat ccgtaagtga tgtgttaagg tgcttcaaag gaactctgac 240
ctctgaagta cttgagctac tttagtatgt ccagcctatt gctttttgtt ttagngngtc 300
accataaata tcaggggcat aaaaggctat ctattcttaa ttcaaggata aaacagaaga 360
agcttgtggn ataaaacaat agtcaagatc cag 393

<210> 779
<211> 277
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(277)
<223> n = A,T,C or G

<400> 779
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ctatttcctg agcgtctgag atgttagtat tagttagttt tgttgtgagt gttaggaaaa 180
gggcatacag gactaggaag cagataagga aaatgactat gagggcgtga tcatgaaagg 240
tgataagctc ttctatgata ggggaagtag cgtcttg 277

<210> 780
<211> 328
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(328)
<223> n = A,T,C or G

<400> 780
catgntatgg ataaccatnt taactgtatt ttntgcancc cgtaccttct tgggaataca 60
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attttgccac actgcaacac cttacagatg tggaagatgt gaaatttgtc atcaattatg 180
actaccctaa ctcctcagag gattatattc atcgaattgg aagaactgct cgcagtacca 240
aaacaggcac agcatacact ttctttacac ctaataacat aaagcagggg agcgacctta 300
tctctgtgct tcgggaagct aancaaac 328

<210> 781
<211> 305
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(305)
<223> n = A,T,C or G

<400> 781
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gagttattgt gcagngtgga gtactcaggc tttcttataa agaaaaaaaa agttatctgg 120
taccaaagtg tgcaacctac agaccctcag gtactgccct gtgacttctc tgtatgacat 180
cacaaggctg ccaagtgcct gtttttctag aactaggagt tggtgaggtt tggctantgc 240
tgaaaccatg cataggattg gtttactaaa ttaaaacctt attacgtacg tcctccaaaa 300
gacag 305

<210> 782
<211> 497
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(497)
<223> n = A,T,C or G

<400> 782
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gctgggatag ggagtgatat ttctaggact tagacattga aaactaattc agcctgtagt 120
aacctggatg gttttcaatg gcatggttag tcaaattcat ggttttaaac ttagaagcag 180
ctttcggggg agagggtagg ttggagcatt tattacatat tttactgttt aatgtcttaa 240
ccgtgggcct tttaatttgt aaacactgaa atgattgttg ggctgtggaa aacatttacc 300
tatttacctt ggaagtttta aaagacagtc cactttttag catgtgtgtt gcgtccagcc 360
tgtggtcgtc ttaactaata aatgngattt ttctctcaaa aaaaaaacct ccccgggcgg 420
ccgctcaagg gcnaattccn cacactggcg gccgttacta ggggatccga nctcggtcca 480
agcttggcgt aatcatg 497

<210> 783
<211> 364
<212> PRT
<213> Homo sapien

<400> 783
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Ser Ser Gln Ile Ala Ala Ala Ala Ser Thr Gln Pro Glu Asp Asp Ile
20 25 30
Asn Thr Gln Arg Lys Lys Ser Gln Glu Lys Met Arg Glu Val Thr Asp
35 40 45
Ser Pro Gly Arg Pro Arg Glu Leu Thr Ile Pro Gln Thr Ser Ser His
50 55 60
Gly Ala Asn Arg Phe Val Pro Lys Ser Lys Ala Leu Glu Ala Val Lys
65 70 75 80
Leu Ala Ile Glu Ala Gly Phe His His Ile Asp Ser Ala His Val Tyr
85 90 95
Asn Asn Glu Glu Gln Val Gly Leu Ala Ile Arg Ser Lys Ile Ala Asp
100 105 110
Gly Ser Val Lys Arg Glu Asp Ile Phe Tyr Thr Ser Lys Leu Trp Ser

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        115                 120                 125
Asn Ser His Arg Pro Glu Leu Val Arg Pro Ala Leu Glu Arg Ser Leu
    130                 135                 140
Lys Asn Leu Gln Leu Asp Tyr Val Asp Leu Tyr Leu Ile His Phe Pro
145                 150                 155                 160
Val Ser Val Lys Pro Gly Glu Glu Val Ile Pro Lys Asp Glu Asn Gly
                165                 170                 175
Lys Ile Leu Phe Asp Thr Val Asp Leu Cys Ala Thr Trp Glu Ala Met
            180                 185                 190
Glu Lys Cys Lys Asp Ala Gly Leu Ala Lys Ser Ile Gly Val Ser Asn
        195                 200                 205
Phe Asn His Arg Leu Leu Glu Met Ile Leu Asn Lys Pro Gly Leu Lys
    210                 215                 220
Tyr Lys Pro Val Cys Asn Gln Val Glu Cys His Pro Tyr Phe Asn Gln
225                 230                 235                 240
Arg Lys Leu Leu Asp Phe Cys Lys Ser Lys Asp Ile Val Leu Val Ala
                245                 250                 255
Tyr Ser Ala Leu Gly Ser His Arg Glu Glu Pro Trp Val Asp Pro Asn
            260                 265                 270
Ser Pro Val Leu Leu Glu Asp Pro Val Leu Cys Ala Leu Ala Lys Lys
        275                 280                 285
His Lys Arg Thr Pro Ala Leu Ile Ala Leu Arg Tyr Gln Leu Gln Arg
    290                 295                 300
Gly Val Val Val Leu Ala Lys Ser Tyr Asn Glu Gln Arg Ile Arg Gln
305                 310                 315                 320
Asn Val Gln Val Phe Glu Phe Gln Leu Thr Ser Glu Glu Met Lys Ala
                325                 330                 335
Ile Asp Gly Leu Asn Arg Asn Val Arg Tyr Leu Thr Leu Asp Ile Phe
            340                 345                 350
Ala Gly Pro Pro Asn Tyr Pro Phe Ser Asp Glu Tyr
        355                 360

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      <212> DNA
      <213> Homo sapien

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acaaaaattt aacgcgaatt ttaacaaaat attaacgttt acaatttcag gtggcacttt     480
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<210> 785
<211> 5502
<212> DNA
<213> Homo sapien

<400> 785
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<210> 786
<211> 108
<212> PRT
<213> Homo sapiens

<400> 786
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            20                  25                  30
Ala Ser Pro Arg Ser Pro Val Met Glu Ser Pro Lys Lys Lys Asn Gln
        35                  40                  45
Gln Leu Lys Val Gly Ile Leu His Leu Gly Ser Arg Gln Lys Lys Ile
    50                  55                  60
Arg Ile Gln Leu Arg Ser Gln Val Leu Gly Arg Glu Met Arg Asp Met
65                  70                  75                  80
Glu Gly Asp Leu Gln Glu Leu His Gln Ser Asn Thr Gly Asp Lys Ser
                85                  90                  95
Gly Phe Gly Phe Arg Arg Gln Gly Glu Asp Asn Thr
            100                 105


<210> 787
<211> 152
<212> PRT
<213> Homo sapiens

<400> 787
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Arg Pro Lys Glu Glu Val Pro Arg Ser Lys Ala Leu Glu Val Thr Lys
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Leu Ala Ile Glu Ala Gly Phe Arg His Ile Asp Ser Ala His Leu Tyr
20 25 30
Asn Asn Glu Glu Gln Val Gly Leu Ala Ile Arg Ser Lys Ile Ala Asp
35 40 45
Gly Ser Val Lys Arg Glu Asp Ile Phe Tyr Thr Ser Lys Leu Trp Ser
50 55 60
Thr Phe His Arg Pro Glu Leu Val Arg Pro Ala Leu Glu Asn Ser Leu
65 70 75 80
Lys Lys Ala Gln Leu Asp Tyr Val Asp Leu Tyr Leu Ile His Ser Pro
85 90 95
Met Ser Leu Lys Pro Gly Glu Glu Leu Ser Pro Thr Asp Glu Asn Gly
100 105 110
Lys Val Ile Phe Asp Ile Val Asp Leu Cys Thr Thr Trp Glu Ala Met
115 120 125
Glu Lys Cys Lys Asp Ala Gly Leu Ala Lys Ser Ile Gly Val Ser Asn
130 135 140
Phe Asn Pro Gln Ala Ala Gly Asp
145 150

<210> 788
<211> 1633
<212> DNA
<213> Homo sapiens

<400> 788
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<210> 789
<211> 200
<212> PRT
<213> Homo sapien

<400> 789

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            20                  25                  30
Glu Val Pro Val Asn Phe Ala Glu Phe Ser Lys Lys Cys Ser Glu Arg
        35                  40                  45
Trp Lys Thr Met Ser Gly Lys Glu Lys Ser Lys Phe Asp Glu Met Ala
    50                  55                  60
Lys Ala Asp Lys Val Arg Tyr Asp Arg Glu Met Lys Asp Tyr Gly Pro
65                  70                  75                  80
Ala Lys Gly Gly Lys Lys Lys Lys Asp Pro Asn Ala Pro Lys Arg Pro
                85                  90                  95
Pro Ser Gly Phe Phe Leu Phe Cys Ser Glu Phe Arg Pro Lys Ile Lys
            100                 105                 110
Ser Thr Asn Pro Gly Ile Ser Ile Gly Asp Val Ala Lys Lys Leu Gly
        115                 120                 125
Glu Met Trp Asn Asn Leu Asn Asp Ser Glu Lys Gln Pro Tyr Ile Thr
    130                 135                 140
Lys Ala Ala Lys Leu Lys Glu Lys Tyr Glu Lys Asp Val Ala Asp Tyr
145                 150                 155                 160
Lys Ser Lys Gly Lys Phe Asp Gly Ala Lys Gly Pro Ala Lys Val Ala
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Arg Lys Lys Val Glu Glu Glu Asp Glu Glu Glu Glu Glu Glu Glu Glu
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Glu Glu Glu Glu Glu Glu Asp Glu
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<210> 790
<211> 457
<212> DNA
<213> Homo sapiens

<400> 790

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tcccaggagc ccagtaatgg agagccccaa aaagaagaac cagcagctga aagtcgggat 180
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tagatatttg acttaaacta tctcaataaa gttttgc                         457
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<210> 791
<211> 126
<212> PRT
<213> Homo sapiens

<400> 791
Ser Pro Val Leu Gly Thr Arg Arg Ser Cys Glu Pro Ala Thr Arg Val
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Pro Glu Val Trp Ile Leu Ser Pro Leu Leu Arg His Gly Gly His Thr
20 25 30

Gln Thr Gln Asn His Thr Ala Ser Pro Arg Ser Pro Val Met Glu Ser
35 40 45

Pro Lys Lys Lys Asn Gln Gln Leu Lys Val Gly Ile Leu His Leu Gly
50 55 60

Ser Arg Gln Lys Lys Ile Arg Ile Gln Leu Arg Ser Gln Cys Ala Thr
65 70 75 80

Trp Lys Val Ile Cys Lys Ser Cys Ile Ser Gln Thr Pro Gly Ile Asn
85 90 95

Leu Asp Leu Gly Ser Gly Val Lys Val Lys Ile Ile Pro Lys Glu Glu
100 105 110

His Cys Lys Met Pro Glu Ala Gly Glu Glu Gln Pro Gln Val
115 120 125

<210> 792
<211> 461
<212> DNA
<213> Homo sapiens

<400> 792
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gagagcccca aaaagaagaa ccagcagctg aaagtcggga tcctacacct gggcagcaga 180
cagaagaaga tcaggataca gctgagatcc caggtgctgg gaagggaaat gcgcgacatg 240
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atatttgact taaactatct caataaagtt ttgcagcttt c 461

<210> 793
<211> 108
<212> PRT
<213> Homo sapiens

<400> 793
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5 10 15

Ser Pro Leu Leu Arg His Gly Gly His Thr Gln Thr Gln Asn His Thr
20 25 30

Ala Ser Pro Arg Ser Pro Val Met Glu Ser Pro Lys Lys Lys Asn Gln

35 40 45

Gln Leu Lys Val Gly Ile Leu His Leu Gly Ser Arg Gln Lys Lys Ile
50 55 60

Arg Ile Gln Leu Arg Ser Gln Val Leu Gly Arg Glu Met Arg Asp Met
65 70 75 80

Glu Gly Asp Leu Gln Glu Leu His Gln Ser Asn Thr Gly Asp Lys Ser
85 90 95

Gly Phe Gly Phe Arg Arg Gln Gly Glu Asp Asn Thr
100 105

<210> 794
<211> 970
<212> DNA
<213> Homo sapiens

<400> 794
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<210> 795
<211> 152
<212> PRT
<213> Homo sapiens

<400> 795
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Leu Ala Ile Glu Ala Gly Phe Arg His Ile Asp Ser Ala His Leu Tyr
20 25 30

Asn Asn Glu Glu Gln Val Gly Leu Ala Ile Arg Ser Lys Ile Ala Asp
35 40 45

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Gly Ser Val Lys Arg Glu Asp Ile Phe Tyr Thr Ser Lys Leu Trp Ser
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Thr Phe His Arg Pro Glu Leu Val Arg Pro Ala Leu Glu Asn Ser Leu
65                  70                  75                  80

Lys Lys Ala Gln Leu Asp Tyr Val Asp Leu Tyr Leu Ile His Ser Pro
                85                  90                  95

Met Ser Leu Lys Pro Gly Glu Glu Leu Ser Pro Thr Asp Glu Asn Gly
            100                 105                 110

Lys Val Ile Phe Asp Ile Val Asp Leu Cys Thr Thr Trp Glu Ala Met
        115                 120                 125

Glu Lys Cys Lys Asp Ala Gly Leu Ala Lys Ser Ile Gly Val Ser Asn
    130                 135                 140

Phe Asn Pro Gln Ala Ala Gly Asp
145                 150
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<210> 796
<211> 2435
<212> DNA
<213> Homo sapiens

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<212> PRT
<213> Homo sapiens

<400> 797

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            20                  25                  30

Arg Gly Gly Val Gly Gly Glu Thr Arg Ala Ala Leu Ala Arg Ala Pro
        35                  40                  45

Pro Pro Gly Arg Ala Glu Trp Tyr Gly Pro Ala Gly Val Lys Ala Gly
    50                  55                  60

Gly Arg Arg Arg Val Pro Arg Arg Arg Arg Arg Trp Gly Cys Val Gln
65                  70                  75                  80

Glu Glu Arg Trp Ala Gly Pro Ala Arg Val Gly Gly Arg Pro Arg Gly
                85                  90                  95

Pro Gly Arg Ala Ala Ala Arg Arg Ala Ala Ala Ser Thr Arg Ala Ala
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Ser Pro Arg Cys Thr Thr Cys Arg
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<210> 798
<211> 164
<212> PRT
<213> Homo sapiens

<400> 798

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20 25 30

Ala Ala Gly Ser Gly Glu Lys Arg Ala Leu Pro Trp His Gly Pro Pro
35 40 45

Pro Pro Ala Ala Arg Asn Gly Met Ala Arg Pro Glu Leu Arg Pro Gly
50 55 60

Gly Gly Gly Glu Ser Arg Gly Gly Gly Asp Asp Gly Ala Ala Cys Arg
65 70 75 80

Arg Asn Ala Gly Gln Gly Arg Arg Gly Ser Gly Gly Ala Arg Gly Ala
85 90 95

Arg Ala Glu Arg Arg Arg Ala Gly Arg Gln His Pro Leu Gly Pro His
100 105 110

Arg Arg Gly Ala Gln Arg Ala Ala Glu Arg Ala His Pro Ala Ala Ala
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Val Arg Val Gly Pro Arg Gln Gly Ala Glu Pro Arg Gly His Asp Pro
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Gly Gly Pro Arg Gln Arg Ala Pro His Arg Cys Pro Leu Asp Gln Arg
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Gly Pro Gly Arg

<210> 799
<211> 60
<212> PRT
<213> Homo sapiens

<400> 799
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Glu Arg Ser Arg Ser Arg Ala Gly Asp Arg Gly Val Glu Ala Gly Pro
20 25 30

Arg Arg Gly Arg Gly Arg Asn Ala Arg Cys Pro Gly Thr Gly Pro Pro
35 40 45

Pro Arg Pro Arg Gly Met Val Trp Pro Gly Arg Ser
50 55 60

<210> 800
<211> 2477
<212> DNA

<213> Homo sapien

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<211> 1619
<212> DNA
<213> Homo sapien

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<210> 802
<211> 3115
<212> DNA
<213> Homo sapien

<400> 802
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<211> 1238
<212> DNA
<213> Homo sapien

<400> 803
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<211> 4637
<212> DNA
<213> Homo sapiens

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210> 805
<211> 394
<212> PRT
<213> Homo sapiens

<400> 805
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Ser His Gly Thr Leu Gly Leu Pro Ser Gly Gly Lys Cys Leu Leu Leu
35 40 45

Asp Cys Arg Pro Phe Leu Ala His Ser Ala Gly Tyr Ile Leu Gly Ser
50 55 60

Val Asn Val Arg Cys Asn Thr Ile Val Arg Arg Arg Ala Lys Gly Ser
65 70 75 80

Val Ser Leu Glu Gln Ile Leu Pro Ala Glu Glu Glu Val Arg Ala Arg

85 90 95

Leu Arg Ser Gly Leu Tyr Ser Ala Val Ile Val Tyr Asp Glu Arg Ser
100 105 110

Pro Arg Ala Glu Ser Leu Arg Glu Asp Ser Thr Val Ser Leu Val Val
115 120 125

Gln Ala Leu Arg Arg Asn Ala Glu Arg Thr Asp Ile Cys Leu Leu Lys
130 135 140

Gly Gly Tyr Glu Arg Phe Ser Ser Glu Tyr Pro Glu Phe Cys Ser Lys
145 150 155 160

Thr Lys Ala Leu Ala Ala Ile Pro Pro Pro Val Pro Pro Ser Ala Thr
165 170 175

Glu Pro Leu Asp Leu Asp Cys Ser Ser Cys Gly Thr Pro Leu His Asp
180 185 190

Gln Glu Gly Pro Val Glu Ile Leu Pro Phe Leu Tyr Leu Gly Ser Ala
195 200 205

Tyr His Ala Ala Arg Arg Asp Met Leu Asp Ala Leu Gly Ile Thr Ala
210 215 220

Leu Leu Asn Val Ser Ser Asp Cys Pro Asn His Phe Glu Gly His Tyr
225 230 235 240

Gln Tyr Lys Cys Ile Pro Val Glu Asp Asn His Lys Ala Asp Ile Ser
245 250 255

Ser Trp Phe Met Glu Ala Ile Glu Tyr Ile Asp Ala Val Lys Asp Cys
260 265 270

Arg Gly Arg Val Leu Val His Cys Gln Ala Gly Ile Ser Arg Ser Ala
275 280 285

Thr Ile Cys Leu Ala Tyr Leu Met Met Lys Lys Arg Val Arg Leu Glu
290 295 300

Glu Ala Phe Glu Phe Val Lys Gln Arg Arg Ser Ile Ile Ser Pro Asn
305 310 315 320

Phe Ser Phe Met Gly Gln Leu Leu Gln Phe Glu Ser Gln Val Leu Ala
325 330 335

Thr Ser Cys Ala Ala Glu Ala Ala Ser Pro Ser Gly Pro Leu Gly Glu
340 345 350

Arg Gly Lys Thr Pro Ala Thr Pro Thr Ser Gln Phe Val Phe Ser Phe
355 360 365

Pro Val Ser Val Gly Val His Ser Ala Pro Ser Ser Leu Pro Tyr Leu
370 375 380

His Ser Pro Ile Thr Thr Ser Pro Ser Cys
385 390

<210> 806
<211> 302
<212> PRT
<213> Homo sapiens

<400> 806
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35 40 45

Cys Leu Leu Lys Gly Gly Tyr Glu Arg Phe Ser Ser Glu Tyr Pro Glu
50 55 60

Phe Cys Ser Lys Thr Lys Ala Leu Ala Ala Ile Pro Pro Pro Val Pro
65 70 75 80

Pro Ser Ala Thr Glu Pro Leu Asp Leu Gly Cys Ser Ser Cys Gly Thr
85 90 95

Pro Leu His Asp Gln Gly Gly Pro Val Glu Ile Leu Pro Phe Leu Tyr
100 105 110

Leu Gly Ser Ala Tyr His Ala Ala Arg Arg Asp Met Leu Asp Ala Leu
115 120 125

Gly Ile Thr Ala Leu Leu Asn Val Ser Ser Asp Cys Pro Asn His Phe
130 135 140

Glu Gly His Tyr Gln Tyr Lys Cys Ile Pro Val Glu Asp Asn His Lys
145 150 155 160

Ala Asp Ile Ser Ser Trp Phe Met Glu Ala Ile Glu Tyr Ile Asp Ala
165 170 175

Val Lys Asp Cys Arg Gly Arg Val Leu Val His Cys Gln Ala Gly Ile
180 185 190

Ser Arg Ser Ala Thr Ile Cys Leu Ala Tyr Leu Met Met Lys Lys Arg
195 200 205

Val Arg Leu Glu Glu Ala Phe Glu Phe Val Lys Gln Arg Arg Ser Ile
210 215 220

Ile Ser Pro Asn Phe Ser Phe Met Gly Gln Leu Leu Gln Phe Glu Ser
225 230 235 240

Gln Val Leu Ala Thr Ser Cys Ala Ala Glu Ala Ala Ser Pro Ser Gly
245 250 255

Pro Leu Arg Glu Arg Gly Lys Thr Pro Ala Thr Pro Thr Ser Gln Phe
260 265 270

Val Phe Ser Phe Pro Val Ser Val Gly Val His Ser Ala Pro Ser Ser
275 280 285

Leu Pro Tyr Leu His Ser Pro Ile Thr Thr Ser Pro Ser Cys
290 295 300

<210> 807
<211> 3829
<212> DNA
<213> Homo sapiens

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<211> 781
<212> DNA
<213> Homo sapiens

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a 781

<210> 809
<211> 160

<212> PRT
<213> Homo sapiens

<400> 809
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Arg Glu Glu Gly Gly Pro Arg Ser Gly Gly Ala Gln Ala Lys Leu Gly
20 25 30

Cys Cys Trp Gly Tyr Pro Ser Pro Arg Ser Thr Trp Asn Pro Asp Arg
35 40 45

Arg Phe Trp Thr Pro Gln Thr Gly Pro Gly Glu Gly Arg His Glu Arg
50 55 60

His Thr Gln Thr Gln Asn His Thr Ala Ser Pro Arg Ser Pro Val Met
65 70 75 80

Glu Ser Pro Lys Lys Lys Asn Gln Gln Leu Lys Val Gly Ile Leu His
85 90 95

Leu Gly Ser Arg Gln Lys Lys Ile Arg Ile Gln Leu Arg Ser Gln Cys
100 105 110

Ala Thr Trp Lys Val Ile Cys Lys Ser Cys Ile Ser Gln Thr Pro Gly
115 120 125

Ile Asn Leu Asp Leu Gly Ser Gly Val Lys Val Lys Ile Ile Pro Lys
130 135 140

Glu Glu His Cys Lys Met Pro Glu Ala Gly Glu Glu Gln Pro Gln Val
145 150 155 160

<210> 810
<211> 624
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(624)
<223> n=A,T,C or G

<400> 810
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gcctgctgtg gtactgagcg tcgg 624

<210> 811
<211> 572
<212> DNA
<213> Homo sapiens

<400> 811
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<210> 812
<211> 594
<212> DNA
<213> Homo sapiens

<220>
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<223> n=A,T,C or G

<400> 812
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<210> 813
<211> 561
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (1)...(561)

<223> n=A,T,C or G

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cccttcanag ccctagtcac aggcnncagg gntgttttgt aanttaaant ttcnggaaaa 240
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Val Asn Val Arg Cys Asn Thr Ile Val Arg Arg Arg Ala Lys Gly Ser
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Val Ser Leu Glu Gln Ile Leu Pro Ala Glu Glu Glu Val Arg Ala Arg
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Leu Arg Ser Gly Leu Tyr Ser Ala Val Ile Val Tyr Asp Glu Arg Ser
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Pro Arg Ala Glu Ser Leu Arg Glu Asp Ser Thr Val Ser Leu Val Val
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Gln Ala Leu Arg Arg Asn Ala Glu Arg Thr Asp Ile Cys Leu Leu Lys
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Gly Gly Tyr Glu Arg Phe Ser Ser Glu Tyr Pro Glu Phe Cys Ser Lys
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Thr Lys Ala Leu Ala Ala Ile Pro Pro Pro Val Pro Pro Ser Ala Thr
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Glu Pro Leu Asp Leu Gly Cys Ser Ser Cys Gly Thr Pro Leu His Asp
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Gln Gly Gly Pro Val Glu Ile Leu Pro Phe Leu Tyr Leu Gly Ser Ala
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Tyr His Ala Ala Arg Arg Asp Met Leu Asp Ala Leu Gly Ile Thr Ala
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Gln Tyr Lys Cys Ile Pro Val Glu Asp Asn His Lys Ala Asp Ile Ser
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Thr Ile Cys Leu Ala Tyr Leu Met Met Lys Lys Arg Val Arg Leu Glu
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Glu Ala Phe Glu Phe Val Lys Gln Arg Arg Ser Ile Ile Ser Pro Asn
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Phe Ser Phe Met Gly Gln Leu Leu Gln Phe Glu Ser Gln Val Leu Ala
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SEQUENCE LISTING

<110> Corixa Corporation
Wang, Tongtong
Sangur, Chaitanya S.
Lodes, Michael A.
Fanger, Gary
Vedvick, Tom
Carter, Darrick
Retter, Marc
Mannion, Jane

<120> COMPOSITIONS AND METHODS FOR THERAPY AND DIAGNOSIS OF LUNG CANCER

<130> 210121.478PC

<140> PCT
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tggggctgaa ccagaggaag ccaggctgag ccaagaagct ggaagtatct tgaacggctc     480
tccaaatcca aagattatcc atactcttta tccctccagc gatgtgt                   527
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<210> 2
<211> 490
<212> DNA
<213> Homo sapien
<400> 2

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ccaagagttc tccactgtga agactgaaag gacctggtga catttcggca tcagtcctgt      60
taccacttgg aggtaacaga agcaggctcg tgtcctcctt taattctacc acactacatg     120
actggcaatt ggttctgaaa ttagaacgtt caccatcgta cttaaaatct taggggcatg     180
aagagtcagc tagaacaagg aaaaagaaag tcgcaggtag taggtaagta ggtgggcaca     240
tgaaaagcca agctgctctg tccaacacca gtgtacatgt gctttaacta aatgaactcc     300
agaggccaac agcagcagac ctgctcaatt caccttccaa atcagaacaa gaccaaaaag     360
ctcaggcttg agttgtcaac tatgcatagg ttccgccagt gctgaggggt gtgaggctct     420
agttgtgaag aagctacaag aaatcatgat gcatgtgatc tgggccgcac tggcatttgc     480
agctattcag                                                            490
```

<210> 3

<211> 464
<212> DNA
<213> Homo sapien

<400> 3
ggagctgtgg gcttcagtcg gggccagatt gcaaagctca agggctgcaa agttggtgga 60
gcagtagggt ctgatgaaaa ggttgcctac cttcaaaagc ttggatttga tgtcgtcttt 120
aactacaaga cggtagagtc tttggaagaa accttgaaga aagcgtctcc tgatggttat 180
gattgttatt ttgataatgt aggtggagag ttttcaaaca ctgttatcgg ccagatgaag 240
aaatttggaa ggattgccat atgtggagcc atctctacat ataacagaac cggcccactt 300
cccccaggcc cacccccaga gattgttatc tatcaggagc ttcgcatgga agcttttgtc 360
gtctacccgct ggcaaggaga tgcccgccaa aaagctctga aggacttgct gaaatgggtc 420
ttagagttta aatttcagct tccctacttt gtaattgact gact 464

<210> 4
<211> 510
<212> DNA
<213> Homo sapien

<400> 4
ccttatcaca ctgtaagtgg tccaagcccc tagggatgct cttttttggtt cctggaattt 60
ccagttggat gtgacagaga tctttcagta taggtctaag tcaagagtag cctctgggtt 120
gaggtgggct gggagattaa catcttacct ggggtccttc agataaacct gttggttttt 180
cctgtctcat acagggccat cttaagtttt gatgttgaat taaaactact tctacccct 240
tagttataaa aaaggccaca aggagcattt atgtggatat ctggaagtga gatagttatt 300
ccattcccag gaaaagaaaa ataaagctaa gttacaaaac taaatctata tgcaataaag 360
ttattatata ctgctttgtt taagcagagt cctctggaat ttatgtacag tacattagtt 420
ttcagctatt tatattccac aagttagacc ttaagattct ctggttttaa gacaattgtt 480
aaagatactt ctaaagctct gagcagttca 510

<210> 5
<211> 452
<212> DNA
<213> Homo sapien

<400> 5
acagcgcctc acgcacctga gccccgagga gaaggcgctg aggaggaaac tgaaaaacag 60
agtagcagct cagactgcca gagatcgaaa gaagcctcga atgagtgagc tggaacagca 120
agtggtagat ttagaagaag agaaccaaaa acttttgcta gaaaatcagc ttttacgaga 180
gaaaactcat ggccttgtag ttgagaacca ggagttaaga cagcgcttgg ggatggatgc 240
cctggttgct gaagaggagg cggaagccaa ggtaaatcat ctcctttatt tggtgcctca 300
tgtgagtact ggttccaagt gacatgaccc agcgattatg tttacagtct ggacttctga 360
tcaagagcgt tcttgaaatt ttccttcagt tttaagacat tttcatgcag gcagagtgtt 420
cttcccctaa aggcacttga cactcatttt tt 452

<210> 6
<211> 336
<212> DNA
<213> Homo sapien

<400> 6
tatagagtgc tgacatctga cattgagaaa ttcatgccta ttgtttatac tcccactgtg 60
ggtctggctt gccaacaata tagtttggtg tttcggaagc caagaggtct ctttattact 120
atccacgatc gagggcatat tgcttcagtt ctcaatgcat ggccagaaga tgtcatccag 180
gccattgtgg tgactgatgg agagcgtatt cttggcttgg gagaccttgg ctgtaatgga 240

atgggcatcc ctgtgggtaa attggctcta tatacagctt gcggagggat gaatcctcaa 300
gaatgtctgc ctgtcattct ggatgtggga accgaa 336

<210> 7
<211> 376
<212> DNA
<213> Homo sapien

<400> 7
ctgtgggaaa cctcattgtt ctgtacaaag tactagctaa accagaaagg tgattccagg 60
aggagttagc caaacaacaa caaaaacaaa aaatgtgctg ttcaagtttt cagctttaag 120
atatctttgg ataatgttat ttctattttt tatttttttt cattagaagt taccaaatta 180
agatggtaag acctctgaga ccaaaatttt gtcccatctc taccccctca caactgctta 240
cagaatggat catgtccccc ttatgttgag gtgaccacct aattgctttc ctgcctcctt 300
gaagagaaga aagaaggaag actgtgtttt tgccactgat ttagccatgt gaaactcatc 360
tcattaccct tttctg 376

<210> 8
<211> 406
<212> DNA
<213> Homo sapien

<400> 8
ggtaggggagc aattctatta tttggcattg catggctggg ttgaattaaa acagggagtg 60
agaacaggtg agtctagaag tccaactctg aaaaggacca ctgtacattt gaacacacgg 120
ctgtgttaaa gatgctgcta atatcagtca ctgggtgcac taaaggatct cttactttat 180
gtaaaacgtt gggattgaca agatagatct gatactctgt taagttaccc tctgaagcta 240
cttcctgtga aatactaatg acagcatcat cctgccaagc gaaagaggca ggcataagca 300
aggacaaatt aaaagggggt aagagcctta tcatgatgag gagtcttgtt ttgacatctt 360
gggaaagct gtccatagtg tgaagtcgtc aatttctcac catggt 406

<210> 9
<211> 330
<212> DNA
<213> Homo sapien

<400> 9
actactacca agagctgcag agagccattt ctgaaatgtt tttgcagatt tataaacaag 60
gggttttctt gggcctctcc aatattaagt tcaggccagg atctgtggtg gtacaattga 120
ctctggcctt ccgagaaggt accatcaatg tccacgacgt ggagacacag ttcaatcagt 180
ataaaacgga agcagcctct cgatataacc tgacgatctc agacgtcagc gtgagtgatg 240
tgccatttcc tttctctgcc cagtctgggg ctggggtgcc aggctggggc atcgcgctgc 300
tggtgctggt ctgtgttctg gttgcgctgg 330

<210> 10
<211> 449
<212> DNA
<213> Homo sapien

<400> 10
ctgacggctt tgctgtccca gagccgccta aacgcaagaa aagtcgatgg gacagttaga 60
ggggatgtgc taaagcgtga aatcagttgt ccttaatttt tagaaagatt ttggtaacta 120
ggtgtctcag ggctgggttg gggtccaaag tgtaaggacc ccctgccctt agtggagagc 180
tggagcttgg agccattacc ccttcatcag aagggatttt cggatgtttt cttgggaagc 240
tgttttggtc cttggaagca gtgagagctg ggaagcttct tttggctcta ggtgagttgt 300

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catgcgggta agttgaggtt atcttgggat aaagggtctt ctagggcaca aaactcactc      360
tcggtttatc ttgtatgtcg cttatatttt ttactaaggt gtcaccttat aagcatctat      420
aaattgagtt ctttttctta gttgtatgg                                        449
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<210> 11
<211> 472
<212> DNA
<213> Homo sapien

<400> 11

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cctcgatgca tgctgctcta cctctcatca gcccacagtc tgacacgagg tcatctttgg       60
tctgtggtga ggtatggatg tctgcagtct acacaacagc cctgcagaac gggcctggac      120
aacccttggc ggataagaca gccacacatg gctcaggctg ttaggtgtcc actgtcacag      180
tccaaaggag aaggtacggc ctccaagggg gcagcttaag ccaacatgta agacttgggc      240
acgatgaaac gacggggtc cagctacgaa tgtttttgtt cttgatgtca agttgccagc      300
tactggaagc caggagcagt ttcttctttt tcccactctg tgctgggtac ttgggagagg      360
cgaaataaat acccgactgt ccactcctca gcctaaggtc cttctcaagt cctgcacact      420
cagcacttgc tctttaacgt ggcatatgtt cccccatctt cccctggtaa tg               472
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<210> 12
<211> 371
<212> DNA
<213> Homo sapien

<400> 12

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tttttttttt tttttttttt ttttggarat ttgkcacatt ttattcagwa tttctgctgc       60
actgccagcc tagggatgca cttgattccc aagaaatgca actgtcctat tcgcaragcc      120
gtccacaggt acctaccccc tggactgcag caactttatt accttaacta gcacaraaca      180
gaggttgatt taaactcctt acactcactt ctccratcaa tgaatgggca aaraaacmcc      240
tcatggctct gggaaggcat gctgaraccc gtttttgcaa gtcctgagga atggaaract      300
atagctgcca ggtatcccaa gtctaaggca gggagggkag tatcggcatc actttcactg      360
cattctgttg g                                                           371
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<210> 13
<211> 493
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(493)
<223> n = A,T,C or G

<400> 13

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ccagtccaac ctgctcctca ttattgtata aatgagcaga atcaatatgg cggaagccag       60
ctgcaattgc caattggtg gccctaaag ctttactttt aggaacctct gcaggcgrat       120
aggtgccaaa tcccaggaca ggcatgaagt gaccatcatt cagcttcaca cactgatatt      180
tcgaatccat ttctgtcnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnn nnnnnnnnnc      240
caacctgctc ctcattattg taaacatgtg cagaatcaat atggcggaac ccagcttcta      300
ttgctaattt tgtgacctcc aaagctttac tttctggaac cttggttctt ccgagcgctc      360
agcaatcccg ccgagcttct ttgagacgtc ctcaggtgtc ctttgacgat gcgtcctcca      420
ctttcacaca ctctagcatt ccttcactgg ggtcttcatt gccccacatt gggcagccaq      480
gaatgttggg gtg                                                         493
```

<210> 14

<211> 540
<212> DNA
<213> Homo sapien

<400> 14
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ccagatggtc cataatatgt caccgagcag gtgaatggca tttgtatgtc agccttggtt      60
gtcttgtact ccagggtgga agtcatggta tagagctgag tcactgggtc catttccttt     120
ttaaaattat gaccaccgct ccttcaaggg gatgtagcac ttttccattc ctgtaccatg     180
tgatattgcc atctggataa ctgtcttctg aaatgcagtc acccaacttt tttagctgct     240
ctgtttcgac aaacagtgct ttgcttacaa tttcaggttt agatggttgc ttgaacacct     300
tgactattgt aggtgcctca aacacgttgt cctcagttac tagcatgcac acaaatctct     360
tttcatcact gatccttgca ttactgatag acaaagtgta gttttctgag aggttcaatc     420
tgtctttgta ttctggtaca tcgtcgtact gcacactttt ctttgtagag gatctgaagg     480
caataaatac tggggagcca tcgggctttt catatttcca tttgcccaaa catgagattc     540
```

<210> 15
<211> 421
<212> DNA
<213> Homo sapien

<400> 15
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taccccactc cagcctccca tgtgagcctg tccttatgta tagtgtccaa cctctgattc      60
tagcagtcaa gtgtcttccc caatcctaat gtcccctgat atgtctctag cgacttgacc     120
atctcttgtt ccttgggact gggcccagcc tcttgtctgc ccacttccct ctcattagtc     180
agatagcccc aaaggctcta tctttagctc ccagagaact ttttggtcct cagtatttcc     240
cttccccttt ccttcccatt ccccacaact ggggagggga agggagaaca ggggcacctg     300
atcatcaatc tcccctgccc ctctcttgaa gccccctaga tttggatgaa gagcaggcca     360
gtgagcaggg caaagcctgc taggagcaga atgaccttga ggatcctttg ctcagaactg     420
g                                                                     421
```

<210> 16
<211> 236
<212> DNA
<213> Homo sapien

<400> 16
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gccgtgtgtg cttttcccag tgccgaggta cctatcgctc acggccagga gcttgtcgtg      60
gctgacagcc acgagctgct ctctgtgggc ctgcttcatc tcatccgaga ggccgtacaa     120
gaagtggtcc attcctttgt ctgaaggagc gacaggagca tctacggttg agaagacaga     180
aagtttggct tcgtcgatgt cttgctgtgt gaattttcca gacttagccc agtcga         236
```

<210> 17
<211> 424
<212> DNA
<213> Homo sapien

<400> 17
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ccagaaaggt gacagtggtt ttccagggcc tccctgggcct ccaggtccac ctggtgaagt      60
cattcagcct ttaccaatct tgtcctccaa aaaaacgaga agacatactg aaggcatgca     120
agcagatgca gatgataata ttcttgatta ctcggatgga atggaagaaa tatttggttc     180
cctcaattcc ctgaaacaag acatcgagca tatgaaattt ccaatgggta ctcagaccaa     240
tccagcctga acttgtaaag acctgcaact cagccatcct gacttcccag atggtgaata     300
ttggattgat cctaaccaag gttgctcagg agattccttc aaagtttact gtaatttcac     360
atctggtggt gagacttgca tttatccaga caaaaatctt gagggagtaa gaatttcatc     420
atgg                                                                  424
```

<210> 18
<211> 154
<212> DNA
<213> Homo sapien

<400> 18
gtcaccaact ccttcagcgc ctccacaggg atttcggaca tgacagcaac cttttctccc 60
aggacaattc aaatttgcta aagggaaggg ggaaagaaag ggaaaaggga gaaaaagaaa 120
cacaagagac ttaaaggaca ggaggaggag atgg 154

<210> 19
<211> 445
<212> DNA
<213> Homo sapien

<400> 19
caacaaaatt ggtgaacaca tggaagaaca tggcatcaag tttataagac agttcgtacc 60
aattaaagtt gaacaaattg aagcagggac accaggccga ctcagagtag tagctcagtc 120
caccaatagt gaggaaatca ttgaaggaga atataataca gtgatgctgg caataggaag 180
agatgcttgc acaagaaaaa ttggcttaga aaccgtaggg gtgaagataa atgaaaagac 240
tggaaaaata cctgtcacag atgaagaaca gaccaatgtg ccttacatct atgccattgg 300
cgatatattg gaggataagg tggagctcac cccagttgca atccaggcag gaagattgct 360
ggctcagagg ctctatgcag gttccactgt caaagtgtga ctatgaaaat gttccaacca 420
ctgtatttac tcctttggaa tatgg 445

<210> 20
<211> 211
<212> DNA
<213> Homo sapien

<400> 20
gggtgccact gcctgcttga aagcactttc tgaacctaca gaagttgggt attgtctgaa 60
atcccagagg acccatcagt gccggtgaca agctgtctgt caggggcgag gctccagaac 120
ctgggttcgt ccccagtgag accggaggat gatcccccaa ggactgcgca gcatcagctc 180
ttggtgggcc tctgccttct cttctgtttg g 211

<210> 21
<211> 396
<212> DNA
<213> Homo sapien

<400> 21
tgcccctgta ttggattgcc acacggctca cattgcatgc aagtttgctg agctgaagga 60
aaagattgat cgccgttctg gtaaaaagct ggaagatggc cctaaattct tgaagtctgg 120
tgatgctgcc attgttgata tggttcctgg caagcccatg tgtgttgaga gcttctcaga 180
ctatccacct ttgggtcgct ttgctgttcg tgatatgaga cagacagttg cggtgggtgt 240
catcaaagca gtggacaaga aggctgctgg agctggcaag gtcaccaagt ctgcccagaa 300
agctcagaag gctaaatgaa tattatccct aatacctgcc accccactct taatcagtgg 360
tggaagaacg gtctcagaac tgtttgtttc aattgg 396

<210> 22
<211> 277
<212> DNA
<213> Homo sapien

<400> 22
ggaaccatgt ggccggcgcc cttgatcgtg aggaaggcga tgtgggagaa ctccttcacg 60
aagccggcaa tctgctcccc gctgtccccg tacttcacta accagggccg gcgctgcacc 120
tccatcttct ggttgaggga atcccacaac caccatcccc ccatgaaatt gcaggccatg 180
tctacatctc cattatataa taggatctgg gatttctgtg agctaagcag cttcagatac 240
tgggagttcc tgcttcggta gagacggcgg tactgta 277

<210> 23
<211> 634
<212> DNA
<213> Homo sapien

<400> 23
tctgatcatc catatccaat gttctcattt aaacattacc cagcatcatt gtttataatc 60
agaaactctg gtcctttcgt ctggtggcac ttagagtctt ttgtgccata atgcagcagt 120
atggaggaag gattttatgg agaaatgggg atagtcttca tgaccacaaa taaataaagg 180
aaaactaagc tgcattgtgg gttttgaaaa ggttattata cttcttaaca attcttttttc 240
tcagggactt ttctagctgt atgactgtta cttgaccttc tttgaaaagc attccccaaaa 300
tgctctattt tagatagatt aacattaacc aacataattt tttttagtc gagtcagcat 360
aaatttctaa gtcagcctct agtcgtggtt catctctttc acctgcattt tatttggtgt 420
ttgtctgaag aaaggaaaga ggaaagcaaa tacgaattgt actatttgta ccaaatcttt 480
gggattcatt ggcaaataat ttcagtgtgg tgtattatta aatagaaaaa aaaaatttg 540
tttcctaggt tgaaggtcta attgatacgt ttgacttatg atgaccattt atgcactttc 600
aaatgaattt gctttcaaaa taaatgaaga gcag 634

<210> 24
<211> 512
<212> DNA
<213> Homo sapien

<400> 24
gcaaaacaag cctaagcaag cacaacgaag agcagaagtc agtgaaatta aaaagaggaa 60
aaagaaaaat cataaaaatc ataaaaagtt atttctttga aaagatcaat gaaatttagc 120
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gtgctcataa atttgacaat gtagaggaaa tatctttagt ttttattagc ttttttattt 300
agtttttctc aaaaactaaa acttaataaa actcaaccaa gacaaaatag acaatcagaa 360
tgtagaccata cctcagagac gtggcggatt tggtttcaga ctactgcaat aaaccaaata 420
tggcaataaa aggagtcaca gaaagtggtt tcccagtgta tatatataaa agttacattt 480
actctatgaa gtgcaataac attttgtcta aa 512

<210> 25
<211> 461
<212> DNA
<213> Homo sapien

<400> 25
ctctgtttca gcacctcatt gggattattg aactcattaa attctttaca tgaacttgaa 60
ttgttcattg aaatctctag ccatttccct ggttaaacag gataatcttt tttttttcact 120
aaagaacatt cgtggtggtt tagtgatgag gttaatattc ccctcttgtc cacctccaca 180
ttggaaaaac cacgttggac tgagttttga ggagcaaaga actaatcact tgaccaaagg 240
ggccctgtat ccccacaagc cctgggtatt tttctctcat agagagaaga gggtctgtat 300
ggatacctga aaatgtgatt ttatatattc ttggcatcca ggggagaaaa atcaaaaagc 360
aaggaagtta cagttatctc cccagaaatt aatgggtcat gtcaagacta taggttttca 420

tttccttctg ttgcttgtta gaatgatgtt cttgtgggaa a 461

<210> 26
<211> 317
<212> DNA
<213> Homo sapien

<400> 26
tgctggagtc ggaactgctg cctttgtttg gcggccttgt ttcttaaatc agttccctct 60
taggatttat cacactaaaa aaaaattagt ttttgaaaag aaataggaga atacagaaac 120
atgaatttca cgaggctatc atctaacagt ggggctttc tacacacgtg gtgccaaaat 180
gtgtcattct gagtcaattg caattcctct ctaggagtga aaagagataa aagataagcc 240
aagaaccctg gacagattct tggtgttggt gacaaagagg aaaggacctg agaatggggc 300
tggtggggag aggggg 317

<210> 27
<211> 250
<212> DNA
<213> Homo sapien

<400> 27
taattgctgt gattattaga atttctatcat gactgtattg tacttttgc tctattycag 60
ataagcmaga tctaagaagt tatcaaaact attctttaaa atgctaaagc aggtaacttt 120
ttcttccatt atttttccct cctaccactg agtttgtaa tgaattcctt gtgtatacca 180
gcaatacagg tgaatactaa actgttattt ttagcttctt caaaagctat tttagaaagc 240
ttcctggaa 250

<210> 28
<211> 532
<212> DNA
<213> Homo sapien

<400> 28
cctatatcat tcatttatac agaagctgct tgctgcttag caagttggtg gctttgattt 60
tccttggttg ctttgcagac ctcccttgag aggattcctt ctggatggag atttctttgt 120
tgctgtctcc cttgccacaa ctctgaccaa gattgcattg cgctatgtag ctttgattca 180
ggagaagaaa aagcaaaatt cttttgttgc tgaggctatg ttgctcatgg ctactatcct 240
gcatttggga aaatcctctc ttcctaagaa gccaattact gatgatgatg tggatcgaat 300
ttccctgtgc ctcaaggtct tgtctgaatg ttcacctta atgaatgaca ttttcaataa 360
ggaatgcaga cagtcccttt ctcacatgtt atctgctaaa ctagaagaag agaaattatc 420
ccaaaagaaa gaatctgaaa agaggaatgt gacagtacag cctgatgacc ccatttcctt 480
catgcaacta actgctaaga atgaaatgaa ctgcaaggaa gatcagtttc ag 532

<210> 29
<211> 486
<212> DNA
<213> Homo sapien

<400> 19
ctgtttttgg actttattaa cywttgcaag tggaaaccaa gaaataattg tagcataact 60
ctctctattg tcatgttgct tctttctgca aatatatctt acaagttaga ctttaaacct 120
ttgatctccc acaccaaaag agaaaataat atttatatgg aagtaatttt atttagtgt 180
ttgtgattta ttgtggagag caggbgttta aaaattttag aatttctttt taacaaaatc 240
aaatacattg ttaaggtaac aaagaataat tcactatttc agcatttcaa agcaacatat 300
tctacaactt caaagatatt tgcaaaaata atacaactgt tgaagttcaa atgttatgga 360

aaggaacatt aggagtatga aaagtggtac aaaaacatgt ttctttttat tctcttggat 420
atatatctat atatttagga aaatacatat atgtatgtgt atgtatatat atgtatgaaa 480
atatac 486

<210> 30
<211> 240
<212> DNA
<213> Homo sapien

<400> 30
aagacctgag gaaggaaaac aaattggctt cctgctgaag aakcaaaata gacatttttt 60
aatgtctctt gaccccagtt ccaagttcac cctgttgcct gttcttcctc ccaccctttg 120
gggttctata actgcatccc ccacacatct ttcaccacca ccccatacat accagctctc 180
ctgttgtggg attcaggaca taggaagagt tgctgaaggc acgggtgctt ttgggattcg 240

<210> 31
<211> 233
<212> DNA
<213> Homo sapien

<400> 31
ccattgatgc aggatatcgg cacattgact gtgcctatgt ctatcagaat gaacatgaag 60
tgggggaagc catccaagac aagatccaag agaaggctgt gaagcgggag gacctgttca 120
tcgtcagcaa gttgtggccc actttctttg agagacccct tctgaaggaa gcctttgaga 180
agaccctcaa ggacctgaag ctgagctatc tggacgtcta tcttattcac tgg 233

<210> 32
<211> 233
<212> DNA
<213> Homo sapien

<400> 32
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ggcttggggt caggaacagg ccagcaagag ttaggggcct tagggcactg ggctgttgtt 180
ccattgaagc cgactctggc cctggccctt acttgcttct ctagctctct agg 233

<210> 33
<211> 319
<212> DNA
<213> Homo sapien

<400> 33
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catgatggct tcaggattcc aaagagagtg agagtagaag ctgaaagact tcttgagttc 180
ttggcctgga actgggacta ggacagtgtc acttctgcta agttcttttg gtcagagcaa 240
atcacaaggc tttacccaga ttcaagggat gagaaacaga ctacatgtct tgatgagggg 300
aaccacaaag agcttgtgg 319

<210> 34
<211> 340
<212> DNA
<213> Homo sapien

<400> 34
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ggtacaaatg acctcagcgt gacagcaaac aggacagaga agaccaggct cttactcagg 180
aatcccaccag ccaggaggat gacaatgttg aacaccggaa ccctgatgat atctgtcaca 240
tttgtaaggt tgatttcaga gttaggagtg gagacatcgg cagttgactt gggtggagcc 300
tgggtcacag ctctgggcct ggtatagagt gggcacaagg 340

<210> 35
<211> 170
<212> DNA
<213> Homo sapien

<400> 35
acatgggtcc ttcactcctc gctgagatgt tgcggcagcc ttttcttcca atgcggttgt 60
ggcaggagaa tccacggatg taatgttttc acctttttcc ctgagggtgc tttctgagga 120
accagycctt aagaggtggg gtcttggatt cctgacccag gcgtccggca 170

<210> 36
<211> 475
<212> DNA
<213> Homo sapien

<400> 36
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ctctctattg kcatgttgct tcttttctgca aatatatctt agaagttaga ctttaaacct 120
ttgatctccc acaccaaaag agaaaataat atttatatgg aagtaatttt attttagtgt 180
ttgtgattta ttgtggagag caggtgttta aaactttttag aatttcttta acaaaattct 240
aaagagaaaa taaaaaagaa atcacagtat ttacagagat aacagaatgg cttagccatg 300
caaacaaaat aactttggtt tttccccttt tactttggtt taaatgttga ccaagattca 360
attttttttc ctgccaaata aaacttcaat aaaagtttag aggcaaaata acgtattttc 420
tttttttccc ataatatttt atacagcatc gagtctaaga atattttatg cattt 475

<210> 37
<211> 246
<212> DNA
<213> Homo sapien

<400> 37
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ccaggcagcc aggggctagg acctcatgga tcagcagcaa gtccagcagg ttgtagtcag 120
cgaaggagat ctggtctccc acaatgaagg tcttgccttcc ctggttctgg gacagcaggg 180
tctcaaaagg ctttcagttgc ccgggcagtg ccttcacata gtcatccttg cccacctcat 240
agttgg 246

<210> 38
<211> 512
<212> DNA
<213> Homo sapien

<400> 38
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aagaaaaaag tgactttcaa ctcttcttcc atcatttttta tcatcaccag tgatgaatca 120
ctgtcagttg acgacagcga caaaaccaat gggtccaaag ttgatgtaat ccaagttcgt 180
ccttttgtagg aatgaagaat ggcaacgaaa gatgggggcct taaattggat gccacttttg 240

gactttcatc ataagaagtg tctggaatac ccgttctatg taatatcaac agaaccttgt 300
ggtccagcag gaaatccgaa ttgcccatat gctcttgggc ctcaggaaga ggttgaacaa 360
aaacaaattc ttttaattca acgggtgctt tacataatga aaaaaccact tgtggcacac 420
gatgggcatc taacatcatc atcttctaat gtgttggaga ttttcatttc aaatatattt 480
tttaaattac tctattttcc aaaacacgta at 512

<210> 39
<211> 370
<212> DNA
<213> Homo sapien

<400> 39
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atgtactcga ctctgtccta tttagccttc ccatacctga cttctaatca cttttcctgg 120
tgccctycca tctccctaac cccccctcac agggatgcct cctccccagg ctccagaaac 180
tctgaccctc gcactgctgg agggagccca tgaattgctg gtcaatatcg ctcatcctct 240
akactccatc ctgcgtgtgc ttcttcctac aagagctaga gaggcactga ctgataaata 300
cctgtcacct gcccctttcc cagagggtga aactccaccc actcccactg cagaaatgaa 360
tcttaaatgg 370

<210> 40
<211> 204
<212> DNA
<213> Homo sapien

<400> 40
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ggagcagagc agaccttgtt tttagtggtt ccatgggata aaatgggatt ggaggagcta 120
gaagaattca gggtctggtc caatctgcca gtcttcctga aatatcgaaa atacaccagg 180
gctgctatat cagagccacc ctgg 204

<210> 41
<211> 447
<212> DNA
<213> Homo sapien

<400> 41
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tcaagcaagc acttgacaag attccacagg ccatagagat tttcttctga gaagaatttg 120
tgtttaattt tttgatacca acactgaaca ttcatcaggg aactttcctg aagttcagct 180
caagactacc ctacctgctg tgtttgtgag aagagtagga tcacacacac aggtgcaatc 240
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tctgaggagt gtgaactgtt ggggtcagtt aagacccaac ataactctat cagaagaaaa 360
ctgttgtttg cctttcaacc ttgttttaca gttctgcagt gtagtggagg acgggcaacg 420
tgcatgtgca ggctcaccac tcccagg 447

<210> 42
<211> 498
<212> DNA
<213> Homo sapien

<400> 42
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attagattct cattgcactg aactatattt atatgcctaa gtatgtagaa gtaaaattat 120
ataccccaaa aggattttat cttgttgtat atattaaatg ttatttctgc atatagggtc 180

tttcatggag aaactgatga tgataagctt aatactcact tgtttagcag catctgaatg 240
cacaaatgct ttatatatct cttctgcttt acagggcaaa agatcagact ctgttttctt 300
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ttgcattact tcagcagcag aaagtacatc cttggacttg gaagatttca ttccagattc 480
cagatgtggg atcataga 498

<210> 43
<211> 312
<212> DNA
<213> Homo sapien

<400> 43
caggaagggg gccaagaatg tgagtgcaaa gattggttcc tgagagcccc gagaagaaaa 60
ttcatgacag tgtctgggct gccaaagaag cagtgcccct gtgatcattt caagggcaat 120
gtgaagaaaa caagacacca aaggcaccac agaaagccaa acaagcattc cagagcctgc 180
cagcaatttc tcaaacaatg tcagctaaga agctttgctc tgcctttgta ggagctctga 240
gcgccccactc ttccaattaa acattctcag ccaagaagac agtgagcaca cctaccagac 300
actcttcttc tc 312

<210> 44
<211> 417
<212> DNA
<213> Homo sapien

<400> 44
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ccttctcaag ccatgtttca gagctgagag gcatccccagc aagttttgca gctcacagtt 120
ttttccgtaa attacttatt ctataaaatt ggagtaggcc ataaactttg gagggcccta 180
gaccaatttt ttggattatt tttcgtcttc tatcattccg ctgatcttag atatttctctg 240
cattaaatat taaatatcac ttctaggctg aaaaatcccc ctaaaaatat ttctagctca 300
gatttttcct ccaaattctg caatagaaga tcacaatgtg aactctgcat ctccatgtta 360
aagtctaatg gacattcaca cttagcatgt ctcaaagaaa tctcatgtaa accatgg 417

<210> 45
<211> 494
<212> DNA
<213> Homo sapien

<400> 45
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tggtgcatgt acacgtgtgt gtgtgtatgc gtgtaggagc tcacacttgt gtacacgttt 120
gtgtgcatgc atgtgtgcag gagcttgcac gtttgtggtg ggtacatgta catatgtgag 180
tgatcctgtg tgcaagcccc catgtggaca tggctatgag tgagcgtgga gccaaaagcc 240
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ggtgtgaatc atgcagcagg cccactgtgc gtgtctgaga cggtctgtgg cagggactgg 360
gtgtgaatca gtgaccgtgt ctctgaccaa catgctgaat tacaaactga taatttatta 420
acctgtgcag caacaaataa gatttttcaa aactcaacaa agtgctcaaa gttgacatta 480
cttgctttca agtt 494

<210> 46
<211> 516
<212> DNA
<213> Homo sapien

<400> 46
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cttctattgc taattttgtg acttccaaag ctttacttct cggaacctcc tcctttggcc 120
gtcatttgat cattcaactc tttgtcagtg gcaactcccg ctattttggt gtgttggttt 180
gttactacac agtgagcaca aacatggtgg tccaatacag aggctcttcc tgtcaggtgt 240
caaccagaaa gttcatctaa cactgtgata tttgcatcct tcttgaacag ttgttggctg 300
aagattcctt tgatgaatcg atttttcaaa agagatgatt cttggttctt ccgagcgctc 360
agctctcccg ccgagcttct ttgagacgtc ctcaggtgtc ctttgacgat gcgtcctcca 420
ctttcaccca ctctagcatt ccttcactgg ggtcttcatt gccccacatt gggcagccag 480
gaatgttggg gtgatcagac acaacaccag gtcatg 516

<210> 47
<211> 459
<212> DNA
<213> Homo sapien

<400> 47
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tatagcattg ggcacactcc agcagacgcc cgaattcaaa tcctggaagg atggaagaaa 120
cgcctggaga atatttggga tgagacaccc ctgtattttg ctccaagcag cctctttgac 180
ctaaacttcc aggcaggatt cttaatgaaa aaagaggtac aggatgagga gaaaaaccag 240
aaattggccc tttctgtggg ccatcacttg ggcaagtcca tcccaactga caaccagatc 300
aaagctagaa aatgagattc cttagcctgg atttccttct aacatgttat caaatctggg 360
tatctttcca ggcttccctg acttgcttta gcttttaaga tttgtgtttt tctttttcca 420
caaggaatac atgagaggga atcgaksaaa aaaaaaaaa 459

<210> 48
<211> 430
<212> DNA
<213> Homo sapien

<400> 48
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tcgttctcac cattcagcca ctgataggag ccatcgctgc aggaaatgct gtgattataa 120
agccttctga actgagtgaa aatacagcca agatcttggc aaagcttctc cctcagtatt 180
tagaccagga tctctatatt gttattaatg gtggtgttga ggaaaccacg gagctcctga 240
agcagcgatt tgaccacatt ttctatacgg gaaacactgc ggttggcaaa attgtcatgg 300
aagctgctgc caagcatctg acccctgtga ctcttgaact gggagggaaa agtccatgtt 360
atattgataa agattgtgac ctggacattg tttgcagacg cataacctgg ggaaaatata 420
tgaattgtgg 430

<210> 49
<211> 288
<212> DNA
<213> Homo sapien

<400> 49
ccatccgaag caagattkca gatggcagtg tgaagagaga agacatattc tacacttcaa 60
agctttgcwg caattcccat cgacccagat tggtccgacc agccttggaa agtcactgaa 120
aaaatcttca attggattat gttgacctct accttattca ttttccagtg tctgtaaagc 180
caggtgagga agtgatccca aaagatgaaa atggaaaaat actatttgac acagtggatc 240
tctgtgccac gtgggaggcc rtggagaagt gtaaagatgc aggattgg 288

<210> 50
<211> 411

<212> DNA
<213> Homo sapien

<400> 50
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agggactcca aacccactgcc ggggaactg gaatatcaca aggtctgcgg cttccagctt 240
ctttgttca gccacaatat ctgggctcag atggccttct ttataagcca gaacagactc 300
ggcggatac tgaaagttcg caggtcctt cagtttacct gtgatgtcct ttctggaaat 360
gatgggattg aagttcatgg catagaggtc cgactccacc acctcccatc c 411

<210> 51
<211> 503
<212> DNA
<213> Homo sapien

<400> 51
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tcagttgtaa ataatgaatt aggggccaaa atgcaaaacg aaaaatgaag cagctacatg 180
tagttagtaa tttctagttt gaactgtaat tgaatattgt ggcttcatat gtattatttt 240
atattgtact tttttcatta ttgatggttt ggactttaat aagagaaatt ccatagtttt 300
taatatccca gaagtgagac aatttgaaca gtgtattcta gaaaacaatc cactaactga 360
acagaagtga atgcttatat atattatgat agccttaaac ctttttcctc taatgcctta 420
actgtcaaat aattataacc ttttaaagca taggactata gtcagcatgc tagactgaga 480
ggtaaacact gatgcaatta aga 503

<210> 52
<211> 503
<212> DNA
<213> Homo sapien

<400> 52
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taatatccca gaagtgagac aatttgaaca gtgtattcta gaaaacaata cactaactga 360
acagaagtga atgcttatat atattatgat agccttaaac ctttttcctc taatgcctta 420
actgtcaaat aattataacc ttttaaagca taggactata gtcagcatgc tagactgaga 480
ggtaaacact gatgcaatta aga 503

<210> 53
<211> 531
<212> DNA
<213> Homo sapien

<400> 53
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gaatagtaca tgggaaattc tctttaggcc aggtctagta ttacagkgtg gkgctcaagg 120
ccgcccatca gaacagtgat actctcccaa cagatttcat ccacccogtc tccactaact 180
tttgccataa aaattcctct gaattgtatc ttcttggaag aagtaaatat ctgttcgact 240
atacaaagaa acagagaaac cactcccatt gcaatcaatc ttcaagagag ggagcaggca 300

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aacaaagact gacgtttaaa ggggagtcat gcagagtaac atgggaacac aagcctgaca 480
acctggtcag cttccactta ctctagctcc tttgaactct caacactaaa a 531

<210> 54
<211> 450
<212> DNA
<213> Homo sapien

<400> 54
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taaaatgaaa aggcactctc gtgttctcct cactctgtgc actttgctgt tggtgtgaca 120
aggcatttaa agatgtttct ggcattttct ttttatttgt aaggtggtgg taactatggt 180
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<210> 55
<211> 648
<212> DNA
<213> Homo sapien

<400> 55
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caagctacag caaagcccat tggccggaaa aaatatcaag ggtcaaat 648

<210> 56
<211> 536
<212> DNA
<213> Homo sapien

<400> 56
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aaactatoga actcttcatt gtcagcaaag caaagagtca ctgcatcaat gaaagttcaa 120
gaacctcctg tacttaaaca cgattcgcaa cgttctgtta tttttttgt atgtttagaa 180
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gcttggcgt aatcatggtc atagctgttt cctgtgtgaa attgttatcc gctcacaatt 480
ccacacaaca tacgagccgg aagcataaag tgtaaagcct ggggtgccta atgagt 536

<210> 57 <211> 391

<212> DNA
<213> Homo sapien

<400> 57
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ctttagtagt agtttaaagt agtaactgct actgtattta gtggggtgga attcagaaga 120
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ttctttttgg atccttaata gaaaactcaa t 391

<210> 58
<211> 455
<212> DNA
<213> Homo sapien

<400> 58
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gccctagcca acgccgcatg agagggagtg tcccgagggc ttctgagaag gtttctctca 120
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ccgagagctt accattcctc agacttcttc acatggtgct aacagatttg ttcctaaaag 360
taaagcttta gaggccgtca aattggcaat agaagccggg ttccaccata ttgattctgc 420
acatgtttac aataatgagg agcaggttgg actgg 455

<210> 59
<211> 398
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(398)
<223> n = A,T,C or G

<400> 59
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aataggatcgc ggattcaggt gtggctctat gagcaagtga atatgcggat agaaggctgt 180
atcattggtt ttgatgagta tatgaacctt gtattagatg atgcagaaga gattcattct 240
aaaacaaagt caagaaaaca actngntcgg atcatgctaa aaggagataa tattactctg 300
ctacaaagtg tctccaacta gaaatgatca atgaagtgag aaattgttga gaaggataca 360
gtttgttttt agatatcctt tgtccaatgt gaacattt 398

<210> 60
<211> 532
<212> DNA
<213> Homo sapien

<400> 60
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tcataggact cagttccctt ctgaacactc gggggacatg ggcctctaac tgcccactct 120
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acagaaaaaa acctggcact ttgattttca tgggatggtc ctaacagggt cagtcacctc 240
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gacccttcct tggcacaggg gtgagaaaga gcttggggaa cgcttggcat tatggagggc 360
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aaaatgacaa ggaggaggag agagggaagt gggtggatga ggagcaggct ga 532

<210> 61
<211> 466
<212> DNA
<213> Homo sapien

<400> 61
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cggggaccgc ctcccgcgcc gccaccatgc ccaacttctc tggcaactgg aaaatcatcc 120
gatcggaaaa cttcgaggaa ttgctcaaag tgctgggggt gaatgtgatg ctgaggaaga 180
ttgctgtggc tgcagcgtcc aagccagcag tggagatcaa acagggggga gacactttct 240
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ttgaggagca gactgtgggt gggaggccct gtaagagcct ggtgaaatgg gagagtgaga 360
ataaaatggt ctgtgagcag aagctcctga agggagaggg ccccaagacc tcgtggacca 420
gagaactgac caacgatggg gaactgatcc tgaccatgac ggcgga 466

<210> 62
<211> 548
<212> DNA
<213> Homo sapien

<400> 62
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caccaagttc tgatatcttt taaagacata gttcaaaatt gcttttgaaa atctgtattc 180
ttgaaaatat ccttgttgtg tattaggttt ttaaatacca gctaaaggat tacctcactg 240
agtcatcagt accctcctat tcagctcccc aagatgatgt gtttttgctt accctaagag 300
aggttttctt cttattttta gataattcaa gtgcttagat aaattatgtt ttctttaagt 360
gtttatggta aactctttta aagaaaattt aatatgttat agctgaatct ttttggtaac 420
tttaaatctt tatcatagac tctgtacata tgttcaaatt agctgcttgc ctcatgtgtg 480
tatcatcggt gggatgacag aacaaacata tttatgatca tgaataatgt gctttgtaaa 540
aagatttc 548

<210> 63
<211> 547
<212> DNA
<213> Homo sapien

<400> 63
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atcttgcagc atttttctta aggctatgct tcagtttttc tttgtaagcc atcacaagcc 180
atagtggtag gtttgccctt tggtacagaa ggtgagttaa agctggtgga aaaggcttat 240
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aattttttta cagtatgttt tattaccttt tgatatctgt tgttgcaatg ttagtgatgt 420
tttaaaatgt gatcgaaaat ataatgcttc taagaaggaa cagtagtgga atgaatgtcc 480
aaaagatctt tatgtgttta tggtctgcag aagggatttt gtgatgaaag gggatttttt 540
gaaaat 547

<210> 64
<211> 528
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(528)
<223> n = A,T,C or G

<400> 64
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arccatggac cccgctcgcc cactgggmt gtygatkctg ctgcttttcc tgrckgaggc 120
tgcactgggc gatgctgatc argagccaac aggaaataac roggagatct gkctcctgcc 180
cctagactac kgaccctgcc kggccctact tytccgytac tactacgaca ggyacacgca 240
gagctgccgc cwgttcctgk rckgggcctg craggccaac rccaacwatt yctacaccky 300
kgaggmttrc gackatgctw gatggargat agaaaagtt cccaaattt gccggctgma 360
agtgaatgag gacnaccagg ytgaggggta cacagataag tatttcttta atctaakkwc 420
catgacatgw gaaaattcct ttnncggtgg gngtcaccgg accggattga gaacangttt 480
gcagatgang ctactgggat gggctcctgc rcacnaaaga aantatca 528

<210> 65
<211> 547
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(547)
<223> n = A,T,C or G

<400> 65
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gaatcaaagt tgtcaagcac ccaatatttg aaaggagagg agatgatttg tacacaaatg 180
tgacagtctc attagttgag tcactggttg gctttgagat ggatattact cacttggatg 240
gtcacaaggt acatatttcc cgggataaga tcaccaggcc aggagcgaag ctatggaaga 300
aaggggaagg gctccccaac tttgacaaca acaatatcaa gggctctttg ataatcactt 360
ttgatgtgga ttttccaaaa gaacagttaa cagaggaagc gagagaangt atcaaacagc 420
tactgaaaca agggtcagtg cagaaggtat acaatggact gcaaggatat tgagagtgaa 480
taaaattgga ctttgtttaa aataaagtga ataagcgata tttattatct gcaaggtttt 540
ttttgtg 547

<210> 66
<211> 535
<212> DNA
<213> Homo sapien

<400> 66
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gcacggcgcc ctccaccgcc ggttggtggc ctgcgtgaca gtttcctccc gtcgacatcg 120
aaaggaagcc ggacgtgggc gggragagag cttcatcgca gtaggaatgg cagcccccatc 180
tatgaaggaa agacaggtct gctgggggcc ccgggatgag tactggaagt gtttagatga 240
gaacttagag gatgcttctc aatgcaagaa gttaagaagc tctttcgaat caagttgtcc 300

ccaacagtgg ataaaatatt ttgataaaag aagagactac ttaaaattca aagaaaaatt 360
tgaagcagga caatttgagc cttcagaaac aactgcaaaa tcctaggctg ttcataaaga 420
ttgaaagtat tcttttctgga cattgaaaaa gctccactga ctatggaaca gtaatagttt 480
gaatcatagt gaacatcaat acttgttccc tatatacgac acttgataat taaga 535

<210> 67
<211> 527
<212> DNA
<213> Homo sapien

<400> 67
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tccaaatctg cattgccggt gagatcctca acatcagcat gttgagatgg acctcaaccc 180
aacctctaac cctgaaatac actactcgat attatcttag gtatgtttta gggtttagct 240
tgtaaaataa taatttattt ttgaaggaaa tataaaatat taaagagtaa taatagctat 300
cattttttaa gattcaatct aaaacaatgg actctttttt tttccatttg tgatgtagat 360
aagcaagaca attttgatca tgagtggtga aaagaggatc aaacttgact atttcttgcaa 420
tggcagtcca gcaacaagcc tttcatttac attaaattat aactttttcat tcattcctaa 480
accaaactta aaattctgct ttcctttgag tagaaggtat ttaactt 527

<210> 68
<211> 431
<212> DNA
<213> Homo sapien

<400> 68
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aaaataaaaa gcgggaattt tcccttcgct tgaatattat ccctgtatat tgcatgaatg 120
agagatttcc catatttcca tcagagtaat aaatatactt gctttaattc ttaagcataa 180
gtaaacatga tataaaaata tatgctgaat tacttgtgaa gaatgcattt aaagctattt 240
taaatgtgtt tttatttgta agacattact tattaagaaa ttggttatta tgcttactgt 300
tctaatctgg tggtaaaggt attcttaaga atttgcaggt actacagatt ttcaaaactg 360
aatgagaaaa aattgtataa ccatcctgct gwtcctttag tgcaataaaa taaaactctg 420
aaattaaaac t 431

<210> 69
<211> 399
<212> DNA
<213> Homo sapien

<400> 69
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agagccccaa aaagaagaac cagcagctga aagtcgggat cctacacctg ggcagcagac 120
agaagaagat caggatacag ctgagatccc agtgcgcgac atggaaggtg atctgcaaga 180
gctgcatcag tcaaacaccg gggataaatc tggatttggg ttccggcgtc aaggtgaaga 240
taatacctaa agaggaacac tgtaaaatgc cagaagcagg tgaagagcaa ccacaagttt 300
aaatgaagac aagctgaaac aacgcaagct ggttttatat tagatatttg acttaaacta 360
tctcaataaa gttttgcagc tttcaccaur aaaaaaaaa 399

<210> 70
<211> 479
<212> DNA
<213> Homo sapien

<400> 70
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tgagacacgg cggacacaca caaacacaga accacacagc cagtcccagg agcccagtaa 120
tggagagccc caaaagaaag aacccgcagc tgaaagtcgg gatcctacac ctgggcagca 180
gacagaagaa gatcaggata cagctgagat cccaggtgct gggaagggaa atgcgcgaca 240
tggaaggtga tccgcaagag ctgcatcagc [illegible] 300
tccggcgtca aggtgaagat aatacctaaa gaggaacact gtaaaatgcc agaagcaggt 360
gaagagcaac cacaagttta aatgaagaca acctgaaaca acgcaagctg gttttatatt 420
aggatatttg acttaaacta tctcaataaa gttttgcagc tttcaccaaa aaaaaaaa 479

<210> 71
<211> 437
<212> DNA
<213> Homo sapien

<400> 71
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agaactctca ccaaaggacc agacacagtg rgcaccatgg gacagtgtcg gtcagccaac 120
gcagaggatg ctcaggaatt cagtgatgtg gagagggcca ttgagaccct catcaagaac 180
tttcaccagt actccgtgga gggtgggaag gagacgctga cccttctga gctacgggac 240
ctggtcaccc agcagctgcc ccatctcatg ccgagcaact gtggcctgga agagaaaatt 300
gccaacctgg gcagctgcaa tgactctaaa ctggagttca ggagtttctg ggagctgatt 360
ggagaagcgg ccaagagtgt gaagctggag aagcctgtcc ggggccactg agaactccct 420
ctggaattct tggggg 437

<210> 72
<211> 561
<212> DNA
<213> Homo sapien

<400> 72
ggatggtata ctgtaaattc agcatatgga gataccatta tcataccttg ccgacttgac 60
gtacctcaga atctcatgtt tggcaaatgg aaatatgaaa agcccgatgg ctccccagta 120
tttattgcct tcagatcctc tacaaagaaa agtgtgcagt acgacgatgt accagaatac 180
aaagacagat tgaacctctc agaaaactac actttgtcta tcagtaatgc aaggatcagt 240
gatgaaaaga gatttgtgtg catgctagta actgaggaca acgtgtttga ggcacctaca 300
atagtcaagg tgttcaagca accatctaaa cctgaaattg taagcaaagc actgtttctc 360
gaaacagagc agctaaaaaa gttgggtgac tgcatttcag aagacagtta tccagatggc 420
aatatcacat ggtacaggaa tggaaaagtg ctacatcccc ttgaaggagc ggtggtcata 480
atttttaaaa aggaaatgga cccagtgact cagctctata cctgaactc caccctggag 540
tacaagacaa ccaaggctga c 561

<210> 73
<211> 916
<212> DNA
<213> Homo sapien

<400> 73
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cactctggga acctataaag gcaggtattt cgggccctcc tcttcaggaa tctttcctgaa 120
gacatggccc agtcgaaggc ccaggatggc ttttgctgcg ccccgtggg gtaggaggga 180
cagagagaca gggagagtca gcctccacat tcagaggcat cacaagtaat ggcacaattc 240
ttcggatgac tgcagaaaat agtgttttgt agttcaacaa ctcaagacga agcttatttc 300
tgaggataag ctctttaaag gcaaagcttt attttcatct ctcatctttt gtcctcctta 360
gcacaatgta aaaaagaata gtaatatcag aacaggaagg aggaatggct tgctggggag 420

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ccatccagg acactgggag cacatagaga ttcacccatg tttgttgaac ttagagtcat      480
tctcatgctt ttctttataa ttcacacata tatgcagaga agatatgttc ttgttaacat      540
tgtatacaac atagccccaa atatagtaag atctatacta gataatccta gatgaaatgt      600
tagagatgct atatgataca actgtggcca tgactgagga aaggagctca cgcccagaga      660
ctgggctgct ctcccggagg ccaaacccaa gaaggtctgg caaagtcagg ctcagggaga      720
ctctgccctg ctgcagacct cggtgtggac acacgctgca tagagctctc cttgaaaaca      780
gaggggtctc aagacattct gcctacctat tagcttttct ttattttttt aacttttttgg     840
ggggaaaagt atttttgaga agtttgtctt gcaatgtatt tataaatagt aaataaagtt      900
tttaccatta aaaaaa                                                     916
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<210> 74
<211> 547
<212> DNA
<213> Homo sapien

<400> 74

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gagatatggc ctttaactga cctaaagagg tgtgttgtga tttaattttt tcccgttcct     120
ttttcttcag taaacccaac aatagtctaa ccttaaaaat tgagttgatg tccttatagg     180
tcactacccc taaataaacc tgaagcaggt gttttctctt ggacatacta aaaaatacct     240
aaaaggaagc ttagatgggc tgtgacacaa aaaattcaat tactgtcatc taatgccagc     300
tgttaaaagt gtggccactg agcatttgat tttataggaa aaaatagtat ttttgagaat     360
aacatagctg tgctattgca catctgttgg aggacatccc agatttgctt atactcagtg     420
cctgtgatat tgagtttaag gatttgaggc aggggtaatt attaaacata ttgcttctat     480
tcttggaaaa atagaagkgt aaaatgttaa taatacaaat gtcactgtga cctcctccac     540
tgagagg                                                               547
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<210> 75
<211> 793
<212> DNA
<213> Homo sapien

<400> 75

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gttctcagtg aaaatccaaa aaccagaaaa aaatgtttat acaacccta  gtcaataacc     120
tgaccttaga aaattgtgag agccaagttg acttcaggaa ctgaaacatc agcacaaaga     180
agcaatcatc aaatcattct gaacacaaat ttaatatttt tttttccgaa tgagaaacat     240
gaggggaaatt gtggagttag cctcctgtgg agttagcctc ctgtggtaaa ggaattgaag    300
aaaatataac accttacacc ctttttcatc ttgacattaa aagttctggc taactttgga     360
atccattaga gaaaatccct tgtcaccaga ttcattacaa ttcaaatcga agagttgtga     420
actgttatcc cattgaaaag accgagcctt gtatgtatgt tatggataca taaaatgcac     420
gcaagccatt atctctccat gggaagctaa gttataaaaa taggtgcttg gtgtacaaaa     540
cttttttatat caaaaggctt tgcacatttc tatatgagtg ggtttactgg taaattatgt    600
tatttttttac aactaatttt gtactctcag aatgtttgtc atatgcttct tgccatgcat    660
atttttttaat ctcaaacgtt tcaataaaac catttttcag atataagag aattacttca     720
cattgagtaa ttcagaaaaa ctcaagattt aagttaaaaa gtggtttgga cttgggaaca     780
ggactttata cct                                                        793
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<210> 76
<211> 461
<212> DNA
<213> Homo sapien

<400> 76

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accttgcact attccccctca gtccatctat cgaggtcttt gcaggaagca tactgggaat    60
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tgaaacgaga gcctaeatga catctaagaa aggcagtgtt caataccagg tattaggtga 120
ggatgggatt ctaaggacat cagtgggagg cagggagcca ccttcagacc tcagcatgga 180
agcttccaag atccagagga agaggcaaca gcactgagag tcataggtag aagaatcatc 240
acagccctgc taaccaggca gctgatgccc ctctccccctg gctccctgtg tccaaatcct 300
acaggggcat ctgttggctg aactcaacct gaagccaaag agaagatgag tggagagagg 360
caacatttat agagtccaag tccctagggc tggagagggc [illegible] [illegible] 420
acacctggca taactaaaaa atgattaaaa aaaaaaaaaa a 461

<210> 77
<211> 642 <212> DNA
<213> Homo sapien

<400> 77
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gctgtgagac tacctattgt agatattgca ccctatgaca ttggtggtcc tgatcaagaa 120
tttggtgtgg acgttggccc tgtttgcttt ttataaacca aactctatct gaaatcccaa 180
caaaaaaaat ttaactccat atgtgttcct cttgttctaa tcttgtcaac cagtgcaagt 240
gaccgacaaa attccagtta tttatttcca aaatgtttgg aaacagtata atttgacaaa 300
gaaaaatgat acttctcttt ttttgctgct ccaccaaata caattcaaat gctttttgtt 360
ttattttttt accaattcca atttcaaaat gtctcaatgg tgctataata aataaacttc 420
aacactcttt atgataacaa aaaaaarawa wattctttga atcctagccc atctgcagag 480
caatgactgt gctcaccagt aaaagataac ctttcttttct gaaatagtca aatacgaaat 540
tagaaaagcc ctccctattt taactaccctc aactggtcag aaacacagat tgtattctat 600
gagtcccaga agatgaaaaa aattttatac gttgataaaa ct 642

<210> 78
<211> 519
<212> DNA
<213> Homo sapien

<400> 78
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ggaggcgccg cccatggaga agccggaagt ggtgaagacg cacctgcggg acatgatcat 240
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cgtaaagcat ggccggcccg gcatcggggc caccccactcc tcccgcttca tccctctcaa 420
gtaatggctc agctaataaa aggcgcacat gactccaaaa aaaaaaaaaa aaggcggccg 480
gccaccgcgg gggagctcca cttttgttcc ctttaatga 519

<210> 79
<211> 526
<212> DNA
<213> Homo sapien

<400> 79
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ggtcacagcc tgatctctta tgtgttcata gccattcgct ctcccatcag aactgtttgt 120
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atggaaaggg gtaacttttg tgcttccaaa gtagctaagc agaagtgggg gagcagttta 480

gccagatgat ctttgattag gcaaacattg agttttaaag aggctg 526

<210> 80
<211> 281
<212> DNA
<213> Homo sapien

<400> 80
gttatattag tgggtagtgt aacattttat ccaggttggg gtgaggggag atggccacag 60
tagcaagtgg tgacactaaa taccattttg aaggctgatg tgtatataca tcattactgt 120
ccgtagcaat gaaggataca gtactgtgtt gtgggtgagt gttgctattg cccagcatta 180
atatttgggt gtgtatgttt gagggctatga aacacgcagg agtgttttg tgctattaat 240
tttaagagaa agcagctttt tcttaaaatt cactgttgag a 281

<210> 81
<211> 405
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(405)
<223> n = A,T,C or G

<400> 81
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tagcaaaccg agcgatcatg tcgcacaaac aaatttacta ttggacaaa tacgacaacg 120
aggagtttga atatcgacat gtcatgctgc ccaaggacat akccaaactg gtccctaaaa 180
cccatctgat gtctgaatct gaatggagga atcttggcng ttcagmagac tcagggatgg 240
gtccattata tgatccatga nccagaacct cdcatcttgc tgttccggcg acccacttac 300
ccccanaaac caamgaaatg aaccttggct actacttttc aatcctcaaa kctttcaca 360
vhtgaccttc cttcctaaca ttctttmtga taaacattta ttaag 405

<210> 82
<211> 547
<212> DNA
<213> Homo sapien

<400> 82
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catttacata atatagaaag atatgcatat atctagaagg tatgtggcat ttatttggat 180
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aaaacaatac cctatgtagt tgtggaagtt tatgctaata ttgtgtaact gatattaaac 300
ctaaatgttc tgcctaccct gttggtataa agatattttg agcagactgt aaacaagaaa 360
aaaaaaatca tgcattctta gcaaaattgc ctagtatgtt aatttgctca aaatacaatg 420
tttgatttta tgcactttgt cgctattaac atcctttttt tcatgtagat ttcaataatt 480
gagtaatttt agaagcatta ttttaggaat atatagtkgt cacagtaaat atcttgtttt 540
ttctatg 547

<210> 83
<211> 529
<212> DNA
<213> Homo sapien

<400> 83

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agccagttgc tcatattgac caatttactg ctgacatgct gggttctgct gagttagctg       180
agggggtcaa tttaaatggt tctggcaaac tgctcaagat tacaggctgt gccagccctg       240
gaaaaacagt tacaattgcc gcttgtggct [illegible] [illegible] [illegible]    300
gctccattca tgatgcccta tgtgttattc gttgtttagt gaagaagagg gctcttattg       360
caggaggtgg tgctccagaa atagagttgg ccctacgatt aactgaatat tcacgaacac       420
tgagtggtat ggaatcctac tgcgttcgtg cttttgcaga tgctatggag gtcattccat       480
ctacactagc tgaaaatgcc cggcctgaat cccatttcta cagtaacag                   529
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<210> 84
<211> 527
<212> DNA
<213> Homo sapien

<400> 84

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acgaaagaac aatttttaaa aagtccctct tttcaatcaa gccaatgtcc tatttttattt      180
ctaaaagttt tgggactcgt gctgttatca agtacaatga aaatggcttt ataaatagct       240
gttttgacat tgtgatagaa ggcttgaata cggagggaag atgtcgctgg agctagtcct       300
gagttccgac tgtccctgtg gtgggaatcc agtctgggaa agcaggactg ttttagcaaa       360
cctgtactcg ttctataaaa atggaatctg ttctgcaggt taccgtccct ccccgcccaa       420
gcatcccctc tgtcctgtct ctctgctgct gggacccagg gctttttcag ctgcagaacc       480
cactggactt ccaggaatca aggaaaaagt ggaaatgtcc aactgtg                     527
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<210> 85
<211> 401
<212> DNA
<213> Homo sapien

<400> 85

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cagtgtggtg gaattcccaa gatagaaatg aaaaactctt ttatagagtg ctgacatctg        60
acattgagaa attcatgcct attgtttata ctcccactgt gggtctggct tgccaacaat       120
atagtttggt gtttcggaag ccaagaggtc tctttattac tatccacgat cgagggcata       180
ttgcttcagt tctcaatgca tggccagaag atgtcatcaa ggccattgtg gtgactgatg       240
gagagcgtat tcttggcttg ggagaccttg gctgtaatgg aatgggcatc cctgtgggta       300
aattggctct atatacagct tgcggaggga tgaatcctca agaatgtctg cctgtcattc       360
tggatgtggg aaccgaaaat gaggagttac ttaaagatcc a                           401
```

<210> 86
<211> 547
<212> DNA
<213> Homo sapien

<400> 86

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gaagcctctt gtgtttgtgt gcagagaagt atatgatcca ccatgctaac gacacttgcc        60
ttttttccca ccattaaggc tttaagaaca tgtggaataa gttttttagc tgctaatgcc       120
aaaacaaatc ctgtaactac ccagcccgca agtatatagc acagaacact gtgttacttt       180
acaagggctt atgtgactgg aataaggtgg tcccacttga ctgttccaaa gagcagcttc       240
tcagatcttc agtgttcact ggtaaatttc taacagtgta tttgtgtaaa gtttgtcatt       300
tcatactcca tacactacag ttgctgtcac tgatccctgt tttgctggct tttaagctac       360
ctggtcaaaa atcctgcttc cttaaaacat agagaattaa tgagcatctc aagctttttc       420
ttttcctttt taatgatgcc tgcactatca agagtattct agtgttctct ctttgtttgg       480
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catataatca tgcaccaaac tttttatttc tttaaggtgg gagtatattt ttatttccta 540
aatgcca 547

<210> 87
<211> 530
<212> DNA
<213> Homo sapien

<400> 87
atggattcga aataccagkg tgtgaagctg aatgatggtc acttcatgcc tgtcctggga 60
tttggcacct atgcgcctgc agaggttcct aaaagtaaag ctctagaggc cgtcaaattg 120
gcaatagaag ccgggttcca ccatattgat tctgcacatg tttacaataa tgaggagcag 180
gttggactgg ccatccgaag caagattgca gatggcagtg tgaagagaga agacatattc 240
tacacttcaa agctttggag caattcccat cgaccagagt tggtccgacc agccttggaa 300
aggttactga aaaattttca attggactat gttgacctct atcttattca ttttccagtg 360
tctgtaaagc caggtgagga agtgatccca aaagatgaaa atggaaaaat actatttgac 420
acagtggatc tctgtgccac rtgggaggcc atggagaagt gtaaagatgc aggattggcc 480
aagtccatcg ggtgtccaa cttcaaccac aggctgctag agatgatcct 530

<210> 88
<211> 529
<212> DNA
<213> Homo sapien

<400> 88
acctgagcta agaaggataa ttgtcttttg gtaactaggt ctacaggttt acattttct 60
gtgttcaact caaggataaa ggcaaaatca attttgtaat ttgtttagaa gccagagttt 120
atcttttcta taagtttaca gcctttttct tatatataca gttattgcca cctttgtcaa 180
catgccaagg gactttttta caatttttat ttatttttct agtaccagcc taggaattcg 240
gttagtactc atttgtattc actgtcactt tttctcatgt tctaattata aatgaccaaa 300
atcaagattg ctcaaaaggg taaatgatag ccacagtatt gctccctaaa atatgcataa 360
agtagaaatt cactgccttc ccctcctgtc catgaccttg ggcacaggga agttctggtg 420
tcatagatat cccgttttgt gaggtagagc tgtgcattaa acttgcacat gactggaacg 480
aagtatgagt gcaactcaaa tgtgttgaag atactgcagt catttttgt 529

<210> 89
<211> 547
<212> DNA
<213> Homo sapien

<400> 89
gtttatatat atagcgaata aatctagttg tataaatttt taaatgccgt cagtagaaag 60
cacccaaggt tatgattttt ttcattactg gcttctgatt tctttcactt ctgatccttt 120
tcctttttct cagatgtagc tgagtcttga tcattttaag acaacgatgg gtagaatttt 180
gagattaatg ttaattttcc ctttttgtta atttcagtcc cctctcacta tgcttttgtc 240
cagaaggatc aagaattcta ccatcccttg ggtctttgtg tataaacaat gttaaataaa 300
ggtagactca gtctttaaga tattagacag tttttttagt ccatgggatt gtaaatataa 360
acattaactt tcctataaga atattttggc tttgtaatct atagcctcaa attggtattt 420
attatggatt cactagacaa acagctgttt ccttattgtc tttttctttt agtgtttctg 480
atttgctatc agtagctgtt tttaaagcca tccaaggaaa ataattattt acagtttctg 540
aagtcac 547

<210> 90
<211> 528
<212> DNA

<213> Homo sapien

<400> 90
gagcagcaga agctgtacag caagatgatc gtgggaaccc acaaggaccg gagccgctcc 60
tgagcctacc tccagctggc tggggccacc gtgcgggtg ccaacgggct cagagctgga 120
gttgccgccg ccgcccccac tgccgtgccc cttcccagac ccagggcccc [illegible] 180
ctggatcccs ggactccggc tttcgccgag ccgcagcggg atccctgtgc acccggcgca 240
gcctaccctt ggtggtctaa acggatgctg ctgggtgttg cgacccagga cgagatgcct 300
tgtttctttt acaataagtt gttggaggaa tgccattaaa gtgaactccc cacctttgca 360
cgctgtgcgg gctgagtggt tggggagatg tggccatggt cttgtgctag agatggcggt 420
acaagagtct gttatgcaag cccgtgtgcc agggatgtgc tggggcggc caccсgctct 480
ccaggaaagg cacagctgag gcactgtggc tggcttcggc ctcaacat 528

<210> 91
<211> 547
<212> DNA
<213> Homo sapien

<400> 91
atatacccatt taatacattt acactttctt atttaagaag atattgaatg caaaataatt 60
gacatataga actttacaaa catatgtcca aggactctac atttagactc ttccacatgt 120
acaatctcat catcctgaag cctataatga agaaaaagat ctagaaactg agttgtggag 180
ctgactctaa tcacatgtga tgattggaat taracccmttt ggscyttgra ccttymkwrg 240
raaaawgrmc cmacctttyt taacmtgrac cwccytmatc tctagaagct gggatggact 300
tactatyctk gttwatattt taaatacrga aaggtgctat gctttctgtta ttattccaag 360
actggagata ggcagggcta aaaaggtatt attattttc ctttaatgat ggtgctaaaa 420
ttcttcctat aaaattcctt aaaaataaag atggtttaat cactaccatt gtgaaaacat 480
aactgttaga cttcccgttt ctgaagaaa gagcatcgtt ccaatgcttg ttcactgttc 540
ctctgtc 547

<210> 92
<211> 527
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(527)
<223> n = A,T,C or G

<400> 92
gctggctagt aggggaacat gtagtagccc agccccatgca ttgcagtgca cagagcaaca 60
ttggggtaac aggatgggta cctgtcacgg cctgtgcaaa cataacatgt gtcaccacac 120
tgaaggtatg gtggaacaag tggcctcacc aaggtcggac cccaatggac tttttgcctc 180
ttgggagctt atgggtctat gaggacacag tagcctttcc tatcagcaaa ctggagtgga 240
tgttgtatct gggggtggcc ttatgtacct gctactgttc tccccacatt gcccagatac 300
ctgtataact gagaggcact gkgcctctcag tttttgcgaa tgtgatgagc cccctggtgt 360
ttctaccctt ttggcaatga ctatccctgg agncatgtgt caaaactgta aagcacaatt 420
tactgctctt tgcggagcac accgctcatg ctctgaatta cacctgaktg tccctcctcc 480
wgktawtgaa tgaggttgat cnvatcagaa adgtggkgtt ggcmata 527

<210> 93
<211> 531
<212> DNA
<213> Homo sapien

<400> 93
ggtattcata cagccttcct aaaggcaatg ctttccacag gatttaagat accccagaaa 60
ggcatcctga taggcatcca gcaatcattc cggccaagat tccttggtgt ggctgaacaa 120
ttacacaatg aaggtttcaa gctgtttgcc acggaagcca catcagactg gctcaacgcc 180
aacaatgtcc ctgccacccc agtggcatgg ccgtctcaag aaggacagaa tccccgcctc 240
tcttccatca gaaaattgat tagagatggc agcattgacc tagtgattaa ccttcccaac 300
aacaacacta aatttgtcca tgataattat gtgattcgga ggacagctgt tgatagtgga 360
atccctctcc tcactaattt tcaggtgacc aaactttttg ctgaagctgt gcagaaatct 420
cgcaaggtgg actccaagag tctttttcac tacaggcagt acagtgctgg aaaagcagca 480
tagagatgca gacaccccag ccccattatt aaatcaacct gagccacatg t 531

<210> 94
<211> 547
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(547)
<223> n = A,T,C or G

<400> 94
gttaaacatg gtctgcgtgc cttaagagag acgcttcctg cagaacagga cctgactaca 60
aagaatgttt ccattggaat tgttggtaaa gacttggagt ttacaatcta tgatgatgat 120
gatgtgtctc cattcctgga aggtcttgaa gaaagaccac agagaaaggc acagcctgct 180
caacctgctg atgaacctgc agaaaaggct gatgaaccaa tggaacatta agtgataagc 240
cagtctatat atgtattatc aaatatgtaa gaatacaggc accacatact gatgacaata 300
atctatactt tgaaccaaaa gttgcagagt ggtggaatgc tatgttttag gaatcagtcc 360
agatgtgagt tttttccaag caacctcact gaaacctata taatggaata cattttttct 420
tgaaagggtc tgtataatca ttttccagaa agtatgggta tctatactaa tgtttttata 480
tgaagaacat aggtgtcttt gtggttttaa agacaactgt gaaataaaat tgtttcaccg 540
cctggtn 547

<210> 95
<211> 1265
<212> DNA
<213> Homo sapien

<400> 95
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ctaactggga aagacccagg gagactggga tgggctcatg attctaccta cagaactcat 120
ccaagaaagg aggaaaagct gatttttgtg aacgtcgcta cttgtgcctg aactaactct 180
caggcacatt agtcagaaaa tactacctat ggttactccc ccaggttcct aaaagtaaag 240
ctttagaggc caccaaattg gcaattgaag ctggcttccg ccatattgat tctgctcatt 300
tatacaataa tgaggagcag gttggactgg ccatccgaag caagattgca gatggcagtg 360
tgaagagaga agacatattc tacacttcaa agctttggtg caattcccat cgaccagagt 420
tggtccgacc agccttggaa aggtcactga aaaatcttca attggattat gttgacctct 480
accttattca ttttccagtg tctgtaaagc caggtgagga agtgatccca aaagatgaaa 540
atggaaaaat actatttgac acagtggatc tctgtgccac gtgggaggcc gtggagaagt 600
gtaaagatgc aggattggcc aagtccatcg gggtgtccaa cttcaaccgc aggcagctgg 660
agatgatcct caacaagcca gggctcaagt acaagcctgt ctgcaaccag gtggaatgtc 720
atccttactt caaccagaga aaactgctgg atttctgcaa gtcaaaagac attgttctgg 780
ttgcctatag tgctctggga tcccaccgag aagaaccatg ggtggacccg aactccccgg 840
tgctcttgga ggacccagtc ctttgtgcct tggcaaaaaa gcacaagcga acccccagcc 900

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tgattgccct gcgctaccag ctccagcgtg ggttctggt cctggccaag agctacaatg     960
agcagcgcat cagacagaac gtgcaggttt ttgagttcca gttgactgca gaggacatga    1020
aagccataga tggcctaaac agaaatgtgc gatatttgac ccttgatatt tttgctggcc    1080
ccccctaatta tccatttct gatgaatatt aacatggagg gcattgcatg aggtctgcca    1140
gaaggccctg cgtgtggatg gtgacacaga ggatggctct atgctggtga ctggacacat    1200
cgcctcgggt taaatccttc ctgcttggtg actttagcaa [illegible] [illegible]    1260
ccaga                                                                1265
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<210> 96
<211> 568
<212> DNA
<213> Homo sapien

<400> 96

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ccagtgtggt ggaattcggt ttaattacaa aatttgatca cgatcatatt gtagtctctc      60
aaagtgctct agaaattgtc agtggtttac atgaagtggc catgggtctc tggagcaccc     120
tgaaactgta tcaaagttgt acatatttcc aaacattttt aaaatgaaaa ggcactctcg     180
tgttctcctc actctgtgca ctttgctctt ggtgtgacaa ggcatttaaa gatgtttctg     240
gcattttctt tttatttgta aggtggtggt aactatggtt attggctaga aatcctgagt     300
ttttcaactgt atatatctat agtttgtaaa aagaacaaaa caaccgagac aaaccttga     360
tgctccttgc tcgggcttga ggctgtgggg aagatgcctt ttgggagagg ctgtagctca     420
gggcgtccac tgtgaggctg gacctgttga ctctgcaggg ggcatccatt tagcttcagg     480
ttgtcttgtt tctgtatata gtgacatagc attctgctgc catcttagct gtggacaaag     540
gggcgtcagc tggcatgaga atattttt                                         568
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<210> 97
<211> 546
<212> DNA
<213> Homo sapien

<400> 97

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ttgtaccgta tctgtaggca tcctgtaaat aattccaagg ggaaaactaa acgaggacgt      60
gggttgtatc ctgccaggtt gagtggggct cacacgctag ggtgagatgt cagaaagcgc     120
ttgtattttа accaaccaaa aagaattgta agggtggctt gctgcccggc ttgcactgcc     180
gctcctgggg gtgtgcatct tcgggaaagg tggtggcggg gcgtccacta ggtttcctgt     240
cccctgctgc tccttccgta agaaaatgaa atattctatg cctaatactc acacgcaaca     300
tttcttgtac tttgtaagtc gtttgcgaga atgcagacca cctcactcaa ctgtaaacgg     360
taaagaggtt tttactttttg gtctccgtga gtcgcatctc tactaaggtt tacacaggaa     420
ttccacctga agccttctgt taaagttcta cagcgcgcac tgttaactga acgtcttttt     480
cttcagccta tacgcggatc cttgttttga gctctcagaa tcactcagac aacattttgt     540
aactgc                                                               546
```

<210> 98
<211> 547
<212> DNA
<213> Homo sapien

<400> 98

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actctatatt atttcctttt tacagatgag gcaatttaag ctcaaagcat ttaagtagac     120
aacaaaccta gaatcacata gcaaatgaca gaagccagag gcctccccaag tctctctaac     180
tccaaaccct atgcttactc tactatatca cactacttg caataggaca aagggaatat     240
gtggtaaact atgttcccaq catctaaaag ccaggagtgg ttttcatttt tctttaagaa     300
gatgatagtg tgatttgaaa catatctgaa tttcagaaga ggggactttt aaaaattgcc     360
actcataagg aaagaaagaa ctttttcacc tatttttgaa agaaacgatg gtgagaagat     420
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attcttgata atagagatat gctaacattt gctttgggtg ttttgtaggt tagatttttt 480
tggtgtgtac tttataggct tgcatattgc ttactttaaa cagctgaagt tctaagtaag 540
agtgttc 547

<210> 99
<211> 122
<212> DNA
<213> Homo sapien

<400> 99
cagcctttct gtcatcatct ccacagccca cccatcccct gagcacacta accacctcat 60
gcaggcccca cctgccaata gtaataaagc aatgtcactt ttttaaaaca aaaaaaaaaa 120
aa 122

<210> 100
<211> 449
<212> DNA
<213> Homo sapien

<400> 100
ctgacggctt tgctgtccca gagccgccta aacgcaagaa aagtcgatgg gacagttaga 60
ggggatgtgc taaagcgtga aatcagttgt ccttaatttt tagaaagatt ttggtaacta 120
ggtgtctcag ggctgggttg gggtccaaag tgtaaggacc ccctgccctt agtggagagc 180
tggagcttgg agacattacc ccttcatcag aaggaatttt cggatgtttt cttgggaagc 240
tgtcttggtc cttggaagca gtgagagctg ggaagcttct tttggctcta ggtgagttgt 300
catgcgggta agttgaggtt atcttgggat aaagggtctt ctagggcaca aaactcactc 360
taggtttata ttgtatgtag cttatatttt ttactaaggt gtcaccttat aagcatctat 420
aaattgagtt cttttcttta gttgtatgg 449

<210> 101
<211> 131
<212> DNA
<213> Homo sapien

<400> 101
ccatgttctc tcttgactac gcatatgtga gatttgcccc tccgccccgc tcgtgatagc 60
catccagatc ttttacctgg ccctgtcttg gagaatctgt tttcaatctc cactgattgc 120
ccccttgctg g 131

<210> 102
<211> 199
<212> DNA
<213> Homo sapien

<400> 102
ctgctgcgcc tgatgctggg acagccccgc tcccagatgt aaagaatgcg acttccacaa 60
acctggattt tttatgtaca accctgaccg tgaccgtttg ctatattcct ttttctatga 120
aataatgtga atgataataa aacagctttg acttgaaaaa aaaaaaaaaa aaaaaaaaaa 180
aaaaaaaaaa aaaaaaaaa 199

<210> 103
<211> 321
<212> DNA
<213> Homo sapien

<400> 103
tttttaggt ctttaaactt tttatttgca tattaaaaaa attgtgcatt ccaataatta 60
aaatcatttg aacaaaaaaa aatggcactc tgattaaact gcattacagc ctgcaggaca 120
ccttgggcca gcttggtttt actctagatt tcactgtcgt cccacccccа cttctttcac 180
cccacttttt ccttcaccaa catgcaaagt ctttccttcc ctgccaccca gataatatag 240
acagatgggg aaggtaggcg cgg[illegible] 300
gcacagtcat ttaaacttga t 321

<210> 104
<211> 309
<212> DNA
<213> Homo sapien

<400> 104
tttttttttt ttttttattt tttttttgca tcaaaaaact ttatttccat ttggcccaag 60
gcttgttagg atagttaaaa aagctgccta ttggctggag ggagaggctt aggcaaaacc 120
cctattactt tgcagggggc cctttcaaaag tctctgggct tctatttcaa ccgcgatgat 180
gtggctctgg aaggcgtgag ccactttttc cgggaactgg ccaaggaaaa gcccgagggc 240
tacaaccgtt tcctgaaaat gcaaaaccag cggggcggcc gcgctctttt ccaggacatc 300
aaaaagcca 309

<210> 105
<211> 591
<212> DNA
<213> Homo sapien

<400> 105
cttatttctg catgggtcgg agagtgggcg ggactgcttt actgagttat agtgaatgta 60
gttttaacct aagcgcctca catgactaac tcctcatcca tcaagaatga gctcagctct 120
cacttcccca ctcctcaccc ccctgtaaag taacctttct ccaaggttat gctttcacag 180
gaatagctaa catttattaa attgtggcac gtaagtatct tggatatatt ggctcattga 240
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aggctcccac tgctggtaaa cagtagaggg ggctcctgac ccatcagtct ggcttgacaa 360
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ggaaatgaat gaatggttct tccctggcag cctttgatga cttacaagcc ccttcaaggg 540
ggaaagccat ttttctccct gggactcctt gaaagcccgg gagccctgcc t 591

<210> 106
<211> 450
<212> DNA
<213> Homo sapien

<400> 106
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ccactaaact aattaaggtg ttggcataac ctgtcattga attcaagtgt ccaacaactg 120
tttgcttaaa atatcattag accttaatatt tttttcaaag gcacaaagtt taaacatgcg 180
gggggcgggt gttgagaggg gtctgggata cccttaaacc caaaaaagtg atttgttccc 240
ccttgcccag aagggtgact gttccactgg gcctgtcacc acaggacatt ttccatgaca 300
agcactcacc ttcttgggga aggggcatca ggttggcaca ggaaaggccc aagtgagggg 360
ccactctgta cattaatact ttggtgatta atgtttgggg agaggcagga ttctcaccca 420
ccttttgac ttcaaacact ctcactcaag 450

<210> 107
<211> 116

<212> DNA
<213> Homo sapien

<400> 107
tcgacgaaag ttactgtcac tcagttgtaa atccatcagc ttttcacctg ttaaaatttt 60
tgcaaaatat acatgttctc ctcctgtttt caattcttcc atctttttttc ttgagg 116

<210> 108
<211> 291
<212> DNA
<213> Homo sapien

<400> 108
ctgctcgaag ttgtcaaaac ccacgtgcag ggcaatggag agtccgatgg ccgacccacag 60
cgagtagcgt cctcccaccc aatcccagaa ctcgaacatg ttttgagggt caattccaaa 120
ctccttcact ttggttgtgt tagtagacag ggcaacaaag tgcttcgcca ctgcagtagg 180
atccttggcc gcctggagaa accactcctt cgccgtctct gcattcgtga tggtctcctg 240
ggtagtaaag gtcttggagg caatgatgaa cagggaggac tcggggttca g 291

<210> 109
<211> 662
<212> DNA
<213> Homo sapien

<400> 109
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caccagaagt gtgagaacgc ctaccccggc aacatcacag acaccatggt gtgtgccagc 120
gtgcaggaag gggccaaggа ctcctgccag ggtgactccg gggccctct ggtctgtaac 180
cagtctcttc aaggcattat ctcctggggc caggatccgt gtgcgatcac ccgaaagcct 240
ggtgtctaca cgaaagtctg caaatatgtg gactggatcc aggagacgat gaagaacaat 300
tagactggac ccacccacca cagcccatca ccctccattt ccacttggtg tttggttcct 360
gttcactctg ttaataagaa accctaagcc aagaccctct acgaacattc tttgggcctc 420
ctggactaca ggagatgctg tcacttaata atcaacctgg ggttcgaaat cagtgagacc 480
tggattcaaa ttctgccttg aaatattgtg actctgggaa tgacaacacc tggtttgttc 540
tctgttgtat ccccagcccc aaagacagc tcctggacct tgccccgggg cggcccgctc 600
ggaaaggggg cgaaatttct tcaagaatat ttccatttcc acaaacttgg ggccgggggc 660
cc 662

<210> 110
<211> 323
<212> DNA
<213> Homo sapien

<400> 110
tcctgtgaaa cagcccattt tcctacctac tgtgggttgc tgctcaggag gaacgatatc 60
cgccaataca agcaggaaat ctgcagctcc tctgctatgt gcctcagaac actttcaatt 120
tttctggtca atgctctgat taggtatcat acataaagc cagcatatta gtttaaatct 180
ctaacaaaaa actatatttt ccaaagtcat tatcatttgg gccaattaag tgatcttttc 240
gtcctttgtt gagcttcatc tttagggcat ctcttctttc ttcccattca tgaagttcgg 300
catttccatg tgcaaattta cag 323

<210> 111
<211> 336
<212> DNA
<213> Homo sapien

<400> 111
tccagtgcgc tccagcctta tctaggaaag gaggagtggg tgtagccgtg cagcaagatt 60
ggggcctccc ccatcccagc ttctccacca tcccagcaag tcaggatatc agacagtcct 120
cccctgaccc tcccccttgt agatatcaat tcctaaacag agccaaatac tctatatcta 180
tagtcacagc cctgtacagc atttttcata agttatatag taaatggtct gcatgatttg 240
tgcttcctagt gctctcattt ggaaatgagg caggctttct ctatgaaatg taaagaaaga 300
aaccactttg tatattttgt aataccacct ctgtgg 336

<210> 112
<211> 218
<212> DNA
<213> Homo sapien

<400> 112
tttttttttt tttttttttt tccagtcagg agtattttta atcactgtct acagagacac 60
ctacatacac acacgggtgg ggaatgaacc caaagttttt aggtgaagtc tctcagggcc 120
caccccgtgc cacagacctt cctcggttgc agagattctg ggcaaagcat ccgtgcctcc 180
atgagattat cctggggaga tttagaagaa ttttgtgg 218

<210> 113
<211> 533
<212> DNA
<213> Homo sapien

<400> 113
ctgcaccgac agttgccgatg aaagttctaa tctcttccct cctcctgttg ctgccactaa 60
tgctgatgtc catggtctct agcagcctga atccaggggt cgccagaggc cacagggacc 120
gaggccaggc ttctaggaga tggctccaga aaggcggcca agaatgtgag tgcaaagact 180
ggttcctgag agccccgaga agaaaattca tgacagtgtc tgggctgcca aagaagcagt 240
gcccctgtga tcatttcaag ggcaatgtga agaaaacaag acaccaaagg caccacagaa 300
agccaaacaa gcatcccaga gcctgccagc aatttctcaa acaatgtcag ctaagaagct 360
ttgctctgcc tttgtaggag ctctgagcgc ccactcttcc aattaaacat tctcagccaa 420
gaagacagtg agcacaccta ccagacactc ttcttctccc acctcactct cccactgtac 480
ccacccctaa atcattccag tgctctcaaa aagcatgttt ttcaagatct aaa 533

<210> 114
<211> 261
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(261)
<223> n = A,T,C or G

<400> 114
ccatatctgc tcggcgctac ttctttcttg gattgatcct gantgatgca ttggcgatgc 60
ctttggagaa ggacatgtga tgtgatggtc ttcacgttcc acatgtactc gggcaaatag 120
ggggacaaac tgaagttaaa caggtcgaaa ctagaggagc tgctgaccct ggagctgacc 180
actttcttgg ggaaaaggac acatgaaggt gctttgcaaa agctgatgag caatctggac 240
accaacatag gacaacaacg t 261

<210> 115
<211> 267

<212> DNA
<213> Homo sapien

<400> 115
cctctcctgt gggttccaga ccctgttcca gcaacaattg ctgggacacc tgggccgact 60
gctccacctc gccaggccct ggccctctcc atctcagccc tgacagccac ccagtgataa 120
acacagcagg cttcctaagc aatgtgacgc accagagggg tggtggtaca cgttcccctt 180
gaagtcatct gaaaattaga gaacagattt gcctcatagc tgaagagaga ccctattcca 240
agcatgaatg gccttgacaa tgttcct 267

<210> 116
<211> 239
<212> DNA
<213> Homo sapien

<400> 116
ctgatgacct ggggtctagt gaaaatgcag ggtcagattc agtgggtctg gggtctgaat 60
ctctaaggcg ctgccaagtg atgctgatgc tcctggcttg tggacccccc tgtgtatagc 120
aaagctctag actaggaggt ctcaaccttg gctgcacaga attatctggg gagtttttaa 180
atttcccagt gcccaggctg cattcatatc atagtagaga cagggttttg ccatgctgg 239

<210> 117
<211> 168
<212> DNA
<213> Homo sapien

<400> 117
aaaaaacttt tatattgctg catcttccac agttctttgg gtagtctctg aacttaaaat 60
ttgtaggagt tgtagactac ctaaattttt aagttatgga tttgttcata ggttgtaggg 120
gtaggtaaag aaggaaacag acaagaaaat ggcttcttga ggtggcag 168

<210> 118
<211> 150
<212> DNA
<213> Homo sapien

<400> 118
aaaaaaaaga gtttattttg aaagtatcat agtgtaaaca aacaaattgt accactttga 60
ttttcttgga atacaagact cgtgatgcaa agctgaagtg tgtgtacaag actcttgaca 120
gttgtgcttc tctaggaggt tgggtttttt 150

<210> 119
<211> 154
<212> DNA
<213> Homo sapien

<400> 119
aaactgtgtg agatattaac cagccgccct gttataaaat caggaaatcc aaacagcgat 60
ttacaccgat taacaccccc ttttatattt tttcaaatac actgagaaaa taatcaaacg 120
ttttcatctc tcttgtcttt ttttgttttt tcct 154

<210> 120
<211> 314
<212> DNA
<213> Homo sapien

<400> 120
ctgcgtggag tgacgggagg agggaatcac tgtgtgtgcg agagtgcttc agactcaatt 60
tccaaaataa ttttcacccc tctaagcatg taaattcaaa gatggatcct tcatagaaat 120
taaaaaatca atttgagctc atttcgaata cagaacaagt atggcacaga tggaagtcct 180
gccacgtttc ctttaatgat gctgactcct gtatcatcca ggccagcatg [illegible] [illegible]
ctcagacttt acaggcattt tccgtaattc aatcagtcct gctcccagca caacacagga 300
ggtgattcga gaat 314

<210> 121
<211> 601
<212> DNA
<213> Homo sapien

<400> 121
aaaaaaaacc taattcattg aagtaataac caaataattt tcaatcttga ttcaactgtg 60
attcaaatct tacaccattt gcccctttcta tgaatttatg tataaaattt tttaagagtc 120
agagtttttt ttttcttgatt aattggatgt atttcacaga atttccaact gctcacgtta 180
gttttcttcc ttttagagtt gatctctcta atgtattaga tcctcatgcc tttgatagtc 240
tctctggaat aagtttgcag aaaaaacttc agcatgtgcc aggaacacaa cctcaccttg 300
atcagagtat tgtcaaatca catttgacgt accaggaaat gcaaaggaag aacatcttaa 360
tatgtttatt cagaatcttc tgtgggaaaa gaatgtgaga aacaaggaca atcactgcat 420
ggaggtcata aggctgaagg gattggtgtc aatcaacgac aaatcacaac aagtgattgt 480
ccaggctgtc catgagctct gtgatctgga ggagactcca gtgagctgga aggatgacac 540
tgagagaaca aatcgattgg tcctcattgg cagaattta gataaggata tccttaaaca 600
g 601

<210> 122
<211> 486
<212> DNA
<213> Homo sapien

<400> 122
ctgtttctaa ttgcttttgt gactgttacc ttttagttca tgcccccca aagagctaaa 60
tttcacattt ttacctacaa aattgatttt taattcctgc aaataattta ccattatgag 120
ctacaaggtg ggcaacagcg cctgaggatc taattttatg catattactc ccaagtattt 180
taacacttgt tggagaagca atatctggat caataaaaca ctgtcccatc aaccatttga 240
gtggggagag ggagaagctc ttctgtaagt aagattctgg caagctcttt gaaatgaagtc 300
ttctttccca cagattttct ctactctttc aatacaaacc gatagcagaa gagggaatag 360
aaacctggag gaacttgaat atttttgttc tagatagaga tacagttatt gaaaaggaaa 420
cctagaaagt agtcacacgt cgcttattta ggccagaagt aattgtaccg ggcaaaaatt 480
tcactt 486

<210> 123
<211> 239
<212> DNA
<213> Homo sapien

<400> 123
ctggtgggtc ttttttttcct ctcagagctc aagcctgtag tgcctgatgt catttctttc 60
aagttgccca cagtatctcc acttaaacta ggctagtaac caaaataatg tggacctttct 120
ttaggaaaca gtgtggagga ataggagtcc agcagtaaga taaactggaa atatttgggc 180
gtcttgtacc tggctacgca ccacctcagt gttgttccta cataacaag gcccctttt 239

<210> 124

<211> 610
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(610)
<223> n = A,T,C or G

<400> 124
ccanccaagt cottgatgat cactgacccn cgcgcgcctg ctggaccaag gtggctgcgg 60
ggaaatcgcc acngngcttt cggtttttctt ggtgaaggaa tacaccgcgc cgacagcagg 120
ttttcagtca gggtcaggga ctgttgcttg cgcgcgaaaa tcaccggtac gccgaggttc 180
aggccggtca tgatcgccgg tgcaatgccc gaggcttcga tggtgacgat cttggtgatg 240
cccgaatcct tgaacaacgc agcgaattca tcaccgatca gtttcatcag cgccgggtcg 300
atctggtggt tcagaaaggc gtcgaccttg agtacctgat cggaaagcac gatgccttct 360
tcgcgaattt tcttgtgcag tgcttccacg aaagcttcct ctgttggcgc aacacgcgcc 420
gaaagtagat taaaagtag tcgattctag cgctttaaca tcgcgcgtat atccgccagg 480
gcggtattgc cgcgaacggc tttgacttcg gttggtgtgt cgtcgttgcc ttcccatgcc 540
aggtcatccg gcggcagttc gtcaaggaac cggctggggg cacaatcaat gatctcgccg 600
tactgcttgc 610

<210> 125
<211> 196
<212> DNA
<213> Homo sapien

<400> 125
ctatagggct cgagcggccg cccgggcagg taaaaaatca gcccctaatt tctccatgtt 60
tacacttcaa tctgcaggct tcttaaagtg acagtatcct taacctgcca ccagtgtcca 120
ccctccggcc cccgtcttgt aaaaaggggа ggagaattag ccaaacactg taagcttttа 180
agaagaacaa agtttt 196

<210> 126
<211> 247
<212> DNA
<213> Homo sapien

<400> 126
aaattagtta aaaaaatgca ttcctcattt gatatagcca cattccaaat gcttaaaagc 60
cgcatgtatc tagtgactac catactggag agtacaaata tagaacttta cccgtcactg 120
cagacagttc tgttygattg tgcagcattg gacaatatat acagtttgcc tgtatatgag 180
aaagagagag agagagagag tgtgtgtgtg tgtgtgtgtg tgaagtgcaa taaggctgac 240
aggcatc 247

<210> 127
<211> 590
<212> DNA
<213> Homo sapien

<400> 127
cctccacggc atggcgcaat tgttgttcag ggccgccag gttgctgccc atgccgatgt 60
agatacgttc cacgtgctta ctcgccagac gcactcgaag cgtcgccagc gctacgtttg 120
cgcttgctgc cactgctgcg gcgacgcttt ttcgggccat cgccggtggc ttcgcctttg 180
ctgctgagct ctttgatcat ctcgcggcgc tggctgtcgt tggcgtcctg gtagtcggtc 240

caccactcgc caaggccgtc ggtctgttcg ccggcgcttt cacgcagcag caggaagtca 300
tagcccggca cggaagcgcg ggttgtccag caacaggtcg gcacgtttgc cgctgcggcg 360
tggcaggcgc tcctgcatgt cccagatttc acggatcggc atggtgaagc gtttcgggat 420
ggcgatgcgc tggcattgct cggcgatcag ctcgtgagca gcttcctgca tggctggaat 480
tcccggcatg ccacggtctt gcaggcgcat gacgcgtttc gaaagcgcgg gcccaacag 540
ggcggcaaag aggaacgccg gggtgaccgg tttgtcctgc tggatgcgca 590

<210> 128
<211> 361
<212> DNA
<213> Homo sapien

<400> 128
ctgcccatgg aaaccctcca ggagctgctg gacctgcaca ggaccagtga gaggaggcc 60
attgaagtct tcatgaaaaa ctctttcaag gatgtaacca aagtttccag aaagaattgg 120
agactctact agatgcaaaa cagaatgaca tttgtaaacg gaacctggaa gcatcctcgg 180
attattgctc ggctttactt aaggatattt ttggtcccct agaagaagca gtgaagcagg 240
gaatttattc taagccagga ggccataatc tcttcattca gaaaacagaa gaactgaagg 300
caaagtacta tcggagccct cggaaaggaa tacaggctga agaagttctg cagaaatatt 360
t 361

<210> 129
<211> 546
<212> DNA
<213> Homo sapien

<400> 129
aaaaatacaa attcagtaag actttgctc taacaacaat ttttcaaaac gaatcaacaa 60
caaaaaagta tccagtgttt cttttcttat gaagatataa taaaacacag tattggtaag 120
cacattttaa cagtatgctt ttctttttgta gggaaaggag atatggctat gtctaacatc 180
gtgggatcca atgtgtttga tatgttgtgc cttggtattc catggtttat taaaactgca 240
tttataaatg gatcagctcc tgcagaagta aacagcagag gactaactta cataaccatc 300
tctctcaaca tttcaattat ttttcttttt ttagcagttc acttcaatgg ctggaaacta 360
gacagaaagt tgggaatagt ctgcctatta tcatacttgg ggcttgctac attatcagtt 420
ctatatgaac ttggaattat tggaaataat aaaataaggg gctgtggagg ttgatattat 480
taatagtgtt atgcagaaaa tatgaatggc agcgaggggc agagagaaaa atccatttct 540
tcattt 546

<210> 130
<211> 733
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(733)
<223> n = A,T,C or G

<400> 130
ggggcctctt cctaaaggca ctcatcccat ccaatagggc ttaacctcat gacttaatca 60
actttcaaag acaccacatc ctaatgccat cacatcagaa tttaggcttc aacatatgaa 120
ttttgggggg acacaaacat tcacctcata gcattcattg tttcttgtta ttggcaaagc 180
caagactcac attgtctaag ttatttgact tttgagtccg cagatgtgaa aacagtgcta 240
aacagttcag cttcatgagt ggagaacagc atttgtgaca accaccaaag tacctctgtg 300
gtcagtgtcc tcaaccaggg cacagcatca tggaccagag cctctgcagg gcacagagga 360

gtggtgagga acaggggctc tggagcaacc ccacttccct ctgctttgta tatggggggt 420
tctgcacatg actgcatttg aaaagggctt cactgcgctt gctgaaggag tgcacttgag 480
ctagcggaga gttcccagag ggtgtctgga agaagcaaag gctattcttt gtttcactca 540
gttatagatg gaagtcagac acttctgcct gaagtacttt cacacactcc acagtcttaa 600
gaaggatgga naaagcatgc caactactca naaaaccaca ggtgttcaag caatggtatc 660
ctttctatncc tacaactagt ggacaaagng gggcctctgt aatttgggaa agctaggaaa 720
actttttctg ggg 733

<210> 131
<211> 305
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(305)
<223> n = A,T,C or G

<400> 131
aaacacatac gaatanttna actgtgatta tgaagtgaca gccggctaaa tatgtcttgt 60
attttctctc ttcctttttt tgctaactca tcctttattc cattcctgct tccatggtaa 120
tgcaggctca aataaattac taggatacaa gnttacttca agcctctttt ctgtggaact 180
cataatatga taagcatttg ttacaagatt gcctgtagtt gcttagggga caaattatat 240
tagggaaaga aagtctttct ttagttggtt aaattttcta ttataattgg gtactaaatt 300
tattt 305

<210> 132
<211> 545
<212> DNA
<213> Homo sapien

<400> 132
aaacaatgct acactcattt ttggcaaagt gctgtattgt tcagtctgtg tacaaaactg 60
accatctatg aaccaatcag tataaaaaat ttctataaaa acaaaattta gacagcggct 120
caagaaaaca agctgccatt tatgcataga ttgatgtaca gtaacctaac caaatgtccc 180
ttttgaattt tcaagttact gaaaaaaaat gtgtcagagaa acacattaag aaggcacatg 240
tacagtctac aatactcttc agtctcccta actcatgccc tgcccctata aaggaaatat 300
gttcacaatt ttacttgaga aaaaaaacca aagccactta aaaaaaaaaa aacacacacg 360
caattattaa agttcaaaat ctctggagga aaatacaagc aaaaccactc atacactcca 420
agcctgaaac acacatctaa cctcccccgg tactggtttg gttttcagag gtccacctag 480
aaaacaaatc taaaacttca ggcaaaacag agcaaaactg gacatttaac aattacacaa 540
ttttt 545

<210> 133
<211> 330
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(330)
<223> n = A,T,C or G

<400> 133
aatatttatt actaatatct tataatgttt tgtggnacca tggcatacct tgggtactat 60

tgtaacanat agttcaggaa accctactat aaggtttatc aaatggtctc ataaacagtt 120
acttattcaa gcacgccaaa gctcagtgaa aagtattttt cacccttact ctttctcgtg 180
tcattcaaag agaagttttg atgtagtgta tttatttgta gggagtaatg aacagatcca 240
tttcacagta gactttgtgc tctaggtgat gcagctaatt gccccagttt ggaaaacatg 300
gacttgaatg aattgtcttt tgtttgggac 330

<210> 134
<211> 627
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(627)
<223> n = A,T,C or G

<400> 134
aatatttact tcaaatacat tttaaagctc aacaaacttg tgttgaactg aattgcagat 60
cctgaactct atttgaaaat acatcatgaa acagaaaanc ccattccaaa tgaaaatgat 120
agtgctttgt tgggggtggg aatgaggcgg ggagactaaa tcactattaa cagacttctt 180
ttcccaatgc aatttgtcaa aagttcaaaa gttctgaaat gtactaaatc ttaagcaaat 240
taaattcatg atattactaa aactttttaa atagtgcaat gacttatcaa gttatagtgg 300
ctgcattaag aacaaattat tgtgtgaaat acctgtataa acacaaaata cacttaaata 360
tttctttaca aaaagctgag cattacgcat aatagtggaa tgtctttcat taggtgtact 420
ttttaaagat taacaaaact aacatttcct aaaatgtata catgtgccat atttttgcaa 480
acatgcctga gaatgtattt aaaacatttc tgtagtaaga gtttgcaaga acttcacaaa 540
cctgcaaata aaatgcatct ttttaaaaag gtgaaaatgg catctccaca ctgcaacaat 600
tcaaaaagtg cagcatccct aatcttt 627

<210> 135
<211> 277
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(277)
<223> n = A,T,C or G

<400> 135
aaaatcaaat atattatttg ttaaaaatca gctttgttca ttacnggaaa ttacaccagt 60
ccgttctatt tactttcaaa ccatattcaa ctcctcaact ttcaaacatg taatcaacta 120
atttcaaaag ggaaaaggta ccctttataa aggagagatc tgttaagaca ccaagaaatc 180
aaaattaata tcacttaatc attaagtgga taacacatgc ctcccaatac agtgcagtga 240
gaaacacaaa acatcaattc ccgcgtactc tgcgtcg 277

<210> 136
<211> 485
<212> DNA
<213> Homo sapien

<400> 136
aaaacagaat gaattcattg ttacagttac agaagtcaga agcccaaata cagtctgcct 60
gaaccaaagc cagggtcagc aaggttcctt tccactgttt tgccaacttc tagaggccac 120
ctgtattcct tggttcatgg ccctctcttt cagcatcaaa taatcagcat agctttatga 180

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cattggcagc tctgattttg ctcttttgcc ttcctcttat gtagaccctt gtaattacat      240
tgggtacacc cagataaccc caaataatct ccctatctca agattcttaa tgtaattata      300
ttgggaaagt ccctttgtc atataagata acatagcaat ggattccaag gattagtatg      360
tgagtttctt ttgaggggct ataattaacc ctaccacaat atggaaatgt ctattgtttt      420
tctatgtacc agaaataaga cattaggatg tgaaattaat aacataacac cacttacggc      480
atcacc                                                                 486

     <210> 137
     <211> 552
     <212> DNA
     <213> Homo sapien

     <220>
     <221> misc_feature
     <222> (1)...(552)
     <223> n = A,T,C or G

     <400> 137
ccatcttgca tcaaatgttc ttaaggcagt gactggctat caaccacagt ttctgtctcc       60
ccagttgcaa acacaggatc catgcaacag ttctgagacc atacatttag aaacccaagg      120
ggatgcggat caaatgcaga actcccaaat tataaaacag tcaggctaca ctcaaaacaa      180
aacatagaac atcaacaaca cacatctccc aaaaaagaag tgcaacgcat gcttgtatga      240
accaacaata acaaaaaaac cacaataaaa aatgcagagt ctcccaaaca agttttcaaa      300
tgtattgcan aaagaaaaaa aatgtacata tatataaaat taaaagtctt gaaatactag      360
tgcatagtca attacctaac accaagtttc ttttcttttct gtccaagctc tactgccct      420
ctgatactag cagcatgtct acaggctaag accatagcag caaaaaacgt ttttcatttg      480
gcatttacaa aattaaattc ctgactaaaa atataatttt ttatcaaact atttcttaca      540
gtaataactt tt                                                          552

     <210> 138
     <211> 231
     <212> DNA
     <213> Homo sapien

     <400> 138
aaattttact agtgttactt aatgtatatt ctaaaaagag aatgcagtaa ctaatgccct       60
aaatgtttga tctctgtttg tcattacttt ttcaaaatat ttttttctgt aaagtataat      120
atataaaact tcttgcttaa attgaatttc tatattagtg gttaattgca gtttattaaa      180
gggatcatta tcagtaattt catagcaact gttctagtgt tttgtgtttt t               231

     <210> 139
     <211> 535
     <212> DNA
     <213> Homo sapien

     <400> 139
cagttgccaa ccctctgaac cgtttaggcc ggttcatcgc tgcctttgaa tctgggcggg       60
tggtgatccc gcaagggggtg aaaccaaaga gcgggggctg tgaggccctt cgcagtccct      120
cgtaagtcgc tgcgatggag tgaactatca cgcatcgtgt ttatttcgtc aacacgaaat      180
gtgatttatt tttgcgaatt aacacggcag ttctcggtta cgttttcgga aagcgtgggga      240
tatgattctg tctatcctgt acggatatac agtaattacc gggaggggat tccatggcga      300
agaagcaggc ggcaccggca gcacggcagg aaatgagcgg tatggcgcgc ctcgggcttc      360
gcgtctcatc gatgattaat caccoggtcg cccagacgca gcgctgggtt acgattcatc      420
gcctggacac ggatggggat cgggagtggg aagaggttct gagcgtgatc gctgatacgg      480
acgagctcga gctgacgctc aatgacgatg gcagtgtgac ggtgaagtgg gagca           535
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<210> 140
<211> 640
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(640)
<223> n = A,T,C or G

<400> 140
acattggtgg cacttgaact gagtgcaaac cacaacattc ttcagattgt ggatgtgtgt 60
catgacatag aaaaggatga aaaacttatt cgtctaatgg aagagatcat gagtgagaag 120
gagaataaaa ccattgtttt tgtggaaacc aaaagaagat gtgatgagct taccagaaaa 180
atgaggagag atgggtggcc tgccatgggt atccatggtg acaagagtca acaagagcgt 240
gactgggttc taaatgaatt caaacatgga aaagctccta ttctgattgc tacagatgtg 300
gcctccagag ggctaggtta gtacaaactc gcattcatgg cttggtttcc cagaagatct 360
ccatttaact tttttaaaga aagtttattg ctttctttaa cctgcatttt ttctaagttt 420
tttttcgcat aaaggtgctg tctttgtggc aaggcctagg catgacaatc ggaggactcg 480
agggggatgg aggactagtg atccggctgg ctgcttccag tcgattagag agggaaaaaa 540
gctgaacgtg tgcccantca atcttcaaaa aggcagaaac atatcacctt ntgcccccnt 600
aaacttgttc ttcttccgaa ggggaaaaaa aaaatggaaa 640

<210> 141
<211> 127
<212> DNA
<213> Homo sapien

<400> 141
aaaaatcaca cactgacaac acagaaatac gaaatgctag gaaaagtcta gcatatgaag 60
gaaaaacatg tcttatgcac tctaatataa ttttttcaat tagtataaag gcaaatgcgg 120
ttttttt 127

<210> 142
<211> 126
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(126)
<223> n = A,T,C or G

<400> 142
aaatatcctc tggatgcntt caagtaatac taatcatttc atgngnaaaa gtcttttaat 60
aaacaaattc agagtaaaat taattgaaat atttataata catttgttac acagttattt 120
ccaata 126

<210> 143
<211> 730
<212> DNA
<213> Homo sapien

<220>

<221> misc_feature
<222> (1)...(730)
<223> n = A,T,C or G

<400> 143
gcaagttctg gagtgttcac ttctgagcct gaattccctc ccctgcaaaa tgggggaata 60
ccctcctcag agggtccctg cgagggtgag gggagatcag catggcaggt gtgctgggca 120
cggcagggcc tgggaagggc agatcctttc cccatccctg ccacaaacaa cccaaacctt 180
taaggaaag caatggccct gtgtcaaaaa caaaaacaaa acaaaaccct gtcctaggag 240
actggggccc taatttctaa tagcaagcct ttatgagtcc ctaacactct actgggctga 300
gtatctcaca cgccagagga taacctgcct tctgctcacc accaccccgt agtagttgtc 360
attgtgtcca tttcacagat gaggcaaagg ctcagaagag tcatgtgtta aaccagcttc 420
tagagcccat gcaggagctg caggtgggga gaatcacctc taggtgctct tccccatggaa 480
tcctcaccct ccttgagtgg tcactcactc ancttttccaa tgggtgtgtg acctttgacc 540
agctttcttt ccttctctgg gcctcagttt cccaccttgg acaaagtaag aggtctcttg 600
ggnttcangg tagttcttcc taacttcttt tcctttccat ttgagcatcc ttcttcattt 660
tttgccacct ctcttgtcat tacangcttt taccttcggc cgcgaaccac gcttaagggc 720
naaatttcca 730

<210> 144
<211> 485
<212> DNA
<213> Homo sapien

<400> 144
ctggtcagaa atgattctct tgtgacatca tcgccacaac aggctcgggt ctgtcctccc 60
catatgttac ctgaagatgg agctaccttt cctctgtgtg gcatttgtc gcttatccag 120
tcttctcctc gtagggcata ccagcagatc ttggatgtgc tggatgaaaa tcacctgtgt 180
tgcgtggtgg gtctgctgcc gccacttcta atcctcatca tgacaacgtc aggtatggca 240
tttcaactat agatacaacc attgaaggaa cgtcagatga cctgactgtt gtagatgcag 300
cttcactaag acgacagata atcaaactaa atagacgtct gcaacttctg gaagaggaga 360
acaaagaacc tgcctaaaaaa gaaatggtca tgtattcaat tactgtagct ttctggctgc 420
ttaatagctg gctctggttt cgccgctaga ggtaacatca gccctcaaaa atattgtctc 480
aacag 485

<210> 145
<211> 465
<212> DNA
<213> Homo sapien

<400> 145
ccaagacagc tcgtttctgg agagtatgag ggtgtgtttt cttattgtga aagaactac 60
cttctcttag aggctaggaa gaatgtggtg tgtgtgtgtc tcataaagca accggacatt 120
atagggtgccc aggtcatcta taaaaacgat ccttgggctg tgtaaaaatg aagtggcttt 180
tcagtatcct ctttcacact tgctgcttcg ggagactatg caatgatggg aaggtgattg 240
ccccttttatt tcattcagtg ccatggtccc tgttgttgta gtaatttatt tgtttagttc 300
attttttttt tcttaacagt caagggaag agtgattcct cacactgctt tcaagctgga 360
ctgagccagt ctcattctgg gaaagaaatg ctgtgtccag aactcagcag ctccatctat 420
tttttccagt cgaaagaaac tgatctttag gcagtttttc cttgg 465

<210> 146
<211> 351
<212> DNA
<213> Homo sapien

<400> 146
ccagccgggg taatctgtat gtggcggact tgagctacga cgtgggcggc aagtgcctgt 60
ttgaccagat cagcggcgtg aagcttatgc caactcatcg tttgataaat ccgaggatca 120
gttcaagacg tcgcagcggg tgattttggg aacgtcgttt tcggtcagta aattgtgggt 180
agcaacggag tggttgatcg gcaagaatga tccgtatatt ggcgggagca gctatacgga 240
gagcctgggg gctgggggga gtaaccagtg ggagaattag ttatatatga acattgggct 300
ctacttctga cttaagatct ccagcgtttt aactggcctt atcgtaggca a 351

<210> 147
<211> 654
<212> DNA
<213> Homo sapien

<400> 147
acttattttt aattactgaa tatttcttag acgttttggg acagatttta tgtaatcttt 60
ataagtatga ttttctgaag aaagcaaatg cattagtatg tttgccttaa acttgtagac 120
taaaccaagt attgtaaaat aaacagcgat aacagtgata gtctttaact ctatggtcat 180
tgtatcactc tggaaaatgt ggagtagctg taataaatct actcctgtat tatgctttac 240
agtgcaggtc ttagtttttc tttttctcca tttcttttga aatggcatct cgaacaaagt 300
ccaccaatcc ctttacaaaa gaatgaactg ctcctctgtg tgtacttcat agaaggtgga 360
atcggacaga ggcaggttag tgacagttat tcctgaaata caggagcaga gtacagtctg 420
ttgtggcttc ccggattccg cgcctagctc agccaattaa gcatgagaca taggccattg 480
agccacttag tagttatgcg agtggataga ttggtatgta agagggaaag aggtctgctg 540
taaagaacaa cacttgtttg tctgtgggga aagaaaagca gaatcttgag atgaaagttg 600
gcatacaaat aggatactat cgccagtagg ttatattaca aaacatttat cggg 654

<210> 148
<211> 539
<212> DNA
<213> Homo sapien

<400> 148
tgaatatcat gagggtgatt ttcacctgat tgcaaaactg ccatagtttg aaacactttt 60
tcaatttacc agacacactc tgtcaagact tcatatactt ccaacttgca agcctgtgtt 120
ttgccttctc caacctaaaa aggaaaagct ttaaacgatg aacttacatt ctattaaacc 180
atcagacttg agcttatcca tctgtttagc gtgaatgtac aaaccaggta catttccacc 240
aaacacatag aaaaatcttg tgcatcacag ttcagctaag ggtagtagga caatccttac 300
aatcctcctt ggatttcttt tttaagatgt caaagaagca cgtaagcaac attgttcatt 360
tgttactggg tgttctagat caaaccttca caagctatat atatagcttc atatgctata 420
gcttacaaat ggggtaacaa agtaaaagaa aagaacaaat tatactttga cactttatag 480
tcaaagtata attaaaaaag aaatcctaca gtgggtaatg gagaaataga taattttttc 539

<210> 149
<211> 273
<212> DNA
<213> Homo sapien

<400> 149
tttttggtca ttctcctcaa ggagccgctg gatagtagtc ttgattgact tccaccttgc 60
ccctcataca gtccggtact aaggccaccg acatcccgag gaacctccgg aaccacgacc 120
gccaagcaac tcgacccacg ataggtgggg cctacgctct cgaagttgat tggatgctcc 180
cgcctacagg gcggggtaca gaagggacgt catttgtgac tggacgcgca agagctatac 240
tcagcagctt tcctctgtcc cagcccctag aac 273

<210> 150

<211> 200
<212> DNA
<213> Homo sapien

<400> 150
gtttttacta ccgtatggcc catttaaaag ggatgtgtac gccttacact ataaccctta 60
aaccacctgg aaatatgaaa ctcaaactgc cactgacctc cctcaccaag ctccataaaa 120
gtaaaaaatt ataacaaacc ttattaacca aactgaacga acatatgggc gattgattca 180
ttgccccaac aatcctaggg 200

<210> 151
<211> 515
<212> DNA
<213> Homo sapien

<400> 151
ctgtagcgat ctttaagaat attttatata tgaaatctgg atttagggtt cccatggtct 60
ggcaccacty ggtacagtag ttctacatgg cagtaattca ttggagttga agcagtgagg 120
aaagagtcaa gtactagtct tttatcctca gtgtccagtg actgtcaaga gaaatgggac 180
tgccttctgc attgggacat gtgggttaaa gagtagtcca atatagaaga gtgagaaagt 240
gmaccctctg aggcatagta atgttttatt kraaaacatc tcacatgtat tgaatactta 300
aataggatgt attctgratt actgaatttt ccagattatt gaagcaatca cctttctgtg 360
tttaaagttt tagaaagaat gcttttaaaa atgcttaaca taagataagc ctgttttcat 420
ggtgcaaggt cctttctatg aacatgaatc actggactct gagggttgga ctaagatcac 480
atctacatcc ctttaaaatg actagtgtgc tcaga 515

<210> 152
<211> 243
<212> DNA
<213> Homo sapien

<400> 152
atttcaacaa catacttgtc gaggtagtta taaatcttct tagggggagg tggtggtttc 60
tgttggaatg ccaattttac agcttctgct gctgattcag gttctttaat tatgcttttc 120
tttgagtctg cttcagatag cacaacaaaa aaatgatgac acttttcaca cttgacaaaa 180
cgggtggatg atacaaaagg tctctacatg tgtgcacaag tcgccacatt taggacagcg 240
cag 243

<210> 153
<211> 620
<212> DNA
<213> Homo sapien

<400> 153
ttgtcttctc taccttacca tagccagttg ctttcatttt aaaccagagc aagtaacata 60
ttagtgactt gaatcttcat aagttaaagt aaaaaacagc aaaaaaccta gatctttgtc 120
ttttagaaca cagaccattt tcaggaaagc agttagctaa gtgtttaatt catgaatatt 180
gtatactgca tcccctacca caatttacac aatcctgtgg atagtcctac ctcaccctgg 240
tcaacctaca tgatccttaa gctaatggcg gatcacgatg accttgtaga catgcacaca 300
actatacctt tgtccaacag atcataatat atctgctatc caactggttt tacctgccta 360
atcctactga tttgggcact gcttgtatag tctctcaagt tcacaggaaa tgttgatttt 420
ctaaggtcct catttttaca gagtatacag gcaaagtgac aggggaaaag gaattagtct 480
aagagtaagg ggatgattat tatattgagg ctaaaaccac aaagtggctc aggctttaaa 540
aaaaaacact gtggataatg acaaaaagca taagtaaaaa tattttgaga aaaataaagt 600
acaagttttg aacacccccc 620

<210> 154
<211> 843
<212> DNA
<213> Homo sapien

<400> 154
cattgttagt gacccaagta aatttatagt ttttaagttc agaggaaaaa taaagcctat 60
ttttgttaa cagtcttaat aaataataaa atggaataaa gaaaccaaaa aaaaaagaaa 120
aagtttgtat gaaaattcat ccctatttct ttattttgga ctaagtagtc aaatttctac 180
tatattaata ttatgtaagc gacacccatt taaattcact ctctttgata gaaggtgag 240
ttgattatca cacctgctat tttttcactg ccaaaragac tgcaataacc tccctccatc 300
accctcaaa aacaaacaga aaccatctga ggcatagcca ttgtttacat attgtgtttg 360
tgtgcaccta tctacaacgt tcttttcttct aaggagttta tctgccaata ttttcggctt 420
cagcagcagc gctcttcttg acagactaag agaaggatct acagaaaagt catctgatta 480
aggttttggg tcaaattaaa actctctgga cagaatcctc tttccttcac ttggatttct 540
gcaaacagaa agcagattat tctcctggca caatagcgac tctgaaacg cttatgtttt 600
tcagacttg gcagaactta ttaagaacag catcatcata atacatttgt acaaactcga 660
atttcagtgg ctcttttgtc ccacatgatg catgatgaaa tttataaagg tctgttttac 720
ccccacaggg tcatttcttt tgtgttccta cagagccaat aggcttcact taagtccaag 780
ttattatatt aaccatccct ttcactagac tagagaactt ctttttcatg gtcccatatcg 840
tga 843

<210> 155
<211> 674
<212> DNA
<213> Homo sapien

<400> 155
ttcgtgtca gccccaggtt tgctccagct attcacaagc agaatataac acaagaaaaa 60
caattcatat cccttaggga aaaaagagga tcaattcatc actcaatatt taatacagcc 120
aaaatgagct gccaaaacaa gcacacacac aaatactgtg aacagaaaaa tacaagaaaa 180
tgactaagct gggagtcttg acggggtatg gacattgctt aaagcactta tcagtcccca 240
gaaaaaccaa accaaaaaca tttttacga tggcatggcc tcatggcccc ctttaaaact 300
gttgatggta acaaagggca ggggtgggg agagaaaacc caatcactgc tcccttttg 360
ctcgccagtg tgactgcacc cctcacggca ccggcatgta cacaactacc acacaaggag 420
gacccagtcc ctctgctgat ggcctcctaa aaggcaaggc ttgaatttg gttgatgagc 480
aagttctctc cgttaccaat ccctgccaac cagcactacc atggctgaat tgatctaccg 540
ttttcctgag taaactgtaa ctggctacag tttcggtaac atggaaaaga actcagctac 600
tacagccaac tgcaatactt caggaacccc ctccatccct gggctcctc actcctagtg 660
cacttgatt ggat 674

<210> 156
<211> 671
<212> DNA
<213> Homo sapien

<400> 156
ccttagtga acacctttat ctccatgtcc ctcttagagc ccagagagct gcccataggc 60
attttccaga attcctcatg tcacctagtt caatttccat taactcagat cagccattgt 120
gattcaccat ttgtcaggct ctcagttta acaaaaccta ctatcaccat catccttcaa 180
cagccacagt ctgaattgag ccaacatttt tttttctttg agaaagaagt gggctggggc 240
acaactttta gtctgagggg agctagtagt cggcctgaca attaaagcca tcccataacaa 300
cttttcctca aatgtgttga ctcctcaggg gctaaactgc tcttagctta gaattatgct 360
ttactagaga tctaccatat aagtgggtta atcactacca tcctgtaact agttatatag 420

cttccagaca tgagggagac atcaaacagg gatggaagca accccaagga tatgcaagaa 480
gggcatgatg aacccccttc cctctggcag gagaacaagg ccaaccaagg gacagactgg 540
aaagcactta gatgtttaag gaggagaaag gggaagcttt gaccagtcct tgccttttgc 600
caagttcagc cagttctccg ctgcttgcaa cctctagcgc agtaacattt tgcagaattg 660
cagattttcc c 671

<210> 157
<211> 474
<212> DNA
<213> Homo sapien

<400> 157
cgcgttcttt aattctttaa gcctagaaag tcctttacac tacttaccta aaggtcccaa 60
agtaaaacac acactagtag taaggctagt gcatttccct tctagcactc aaagaaagct 120
taacattttt gacagtttgc aaataccgcc ttgtatttct gattcagcct tattcacagt 180
atcataataa aatatttatt aaatatatgt tgatctgcgt gcatttatga tctccagatt 240
aacgttaggc ttctctgttg ggccctaact tggaggtgct tttttggatc cctcctcctg 300
tgattcattg taatttcatt tcccttgtca tggctctgac cagagaagat tctaaatatc 360
tgcccccaaa gccaacatta tatcttttga aaagtgaaat gaagagttga gtcagtcatt 420
tattttagat attactgcct aaaacaattc cccaaaattt atggaagttg gagg 474

<210> 158
<211> 584
<212> DNA
<213> Homo sapien

<400> 158
ttggattctg cagttccaca tcattcactc cggcaaagga gagaacttgt aacaaagatg 60
agtgccaagt ttagtcaatt taccctacct ggaatactat atacaactct gggtctcatg 120
tgtgttaaaa tacatacagt gaagctgagg aagagccact gaagtaaaaa gtattgttta 180
caagttggaa aggatgtaaa aataatccaa agtatactaa gtcaggaata aaaggcagag 240
ttaataaaat tgtggctggt actgatagac gaaacagata tattttctaa atcctggaat 300
aattacttaa aaattttaca tgtatcaatg gattccagac tccatatttt aagtttcaca 360
actactgtca tttaaaacta taccttattg aacgtctccc actctccata aattacccca 420
aatcactctt ctccaaaacg taaatttgga acacactgac ttacaatttt tgggcttaat 480
ttataggatg ttgtggccct caaaaatatc attgtgggct aaacaaaata aatttcttga 540
acaattctaa aaatcaatca ttgtccaaaa tgaacttttt ctaa 584

<210> 159
<211> 671
<212> DNA
<213> Homo sapien

<400> 159
cctaatttta ttacttttct tgccactgct attattgata gaaatacaat taaataatta 60
agatgaacca atccattgga agattactaa aattgtatct tcccaatgcc tcctacagta 120
agatttcttt ataattataa cccttggaga caatttgaac tttatttaaa tgttctgctc 180
aaatctaaat ttccttctcc taggctgaag cctgatctaa atcaggaagt agttgggata 240
tatccacagg ctgtcgaaca tggagctgca tctgagagac aggtggcagc aaccaaaagc 300
aaagcaggga ctgagaacag gcaggttcca agagcaaaat ggaacttgaa agccaagtat 360
ggctcactgt aaaggagaaa atatagaaat acggaactag aacacctggt ctgggatgtg 420
gtaagcaccc aaaatatagg aaaactgtat gaattcttgt gaagcagtaa actatgatag 480
taatcatgtg acacatatga taacaaactc aaaacaggga aaagaggggc tttattcaat 540
gctggagata agtgaaaaaa aaagtgaagt gtctcaagga caaaagttat catttcaaaa 600
aggcatatca gctagatctc gcggaaacca tatgattatc ataattctag actctgttcg 660

gtattacaaa g 671

<210> 160
<211> 315
<212> DNA
<213> Homo sapien

<400> 160
ccagagaggg aggctctgc ttcaccacag ggcaccagaa gaggactggt gcgcgggaag 60
accaggtaat catactgcta ttaaaaatag cagtaatcat actgttttat acattgtata 120
atgtcataag gattttaact ttcatgtaac ataattgctg taaaagtttc cccagtttgt 180
tttgtgctat ttacccttgt gttaaaatgt gtaagaattt acattttagg tatgttaggt 240
ttattccttt ttatatggtt tctgtttgaa attttgattt tagaagacat tcattctcaa 300
ggtcataaaa cacac 315

<210> 161
<211> 607
<212> DNA
<213> Homo sapien

<400> 161
tttytgtgtc accttggata attgcttaac ttttaaaatt tacgttccct catttccaac 60
aagggattat aactcactgt tattttgata attgagataa atgtacgtac aagtgctttg 120
aaactgtaaa gtgcattata aacagaggga tttaccatag aggttctacc ttgatgtatc 180
aagagaagcc ttttctggaa tctggtgcag ccttgtgaga tgctgttagg taaggggact 240
ccttggtaga atttcttacc tttgtgtaaa aagttctggt tcctgagtaa ttccaaagaa 300
gatgctatga ggagttcact gtgcctttga tttgatccca atgggtcaga atatgttttc 360
tcactcagta ggctactacc ggatttgaag tagaaaaaac agggtccagt gaccttcacg 420
ggatcctaga tgttcatgaa tttcaatcat ttgagattgt ggggtgtggt ccaatgctgc 480
tctcaaaaag atgttgcctt tctttcaaaga gcattaataa ctaaaaaatc ccctggtccc 540
aaatttattg tgtgtmtctg aaggctttaa ctgaagaaat gaaawgcaca ctcatggaac 600
aaactaa 607

<210> 162
<211> 443
<212> DNA
<213> Homo sapien

<400> 162
tgagttttga aaaagtgaat aatcaaaagg aaaataattc cttgttgttc ataaattaag 60
catcactaaa gtctcttgaa aggcatttct gtattgggca agatttaaaa tactaaagcc 120
ttaggtccta ttcatattta aagtagcatg tttgtaacct gttactattt ggagagagaa 180
gcagttgcct gccacaattg aagactacct ttcaaatagc aaaagagaga gagaaggctg 240
atctttcggg ctttaaata aagatttgtc tggttctgct tttactgtaa ctgtcacttt 300
cccagtgaaa atgatttcat atacatttga gggtcttaca agtatgggta aagttctata 360
aattgccacc aaatgatacc caatttcatt ttatcctttt tgtattgtga aactggaaac 420
tttatgacat tgtaaattat cag 443

<210> 163
<211> 686
<212> DNA
<213> Homo sapien

<400> 163
caggcaaatt atagtcaaat acatcacccc cctcaggcat ctgtggcaag gcatccctct 60

agagaacaac taattgatta cttgatgctg aaagtggccc accagcctcc atatccacag 120
ccccattgtt ctcctagaca aggccatgaa ctggcaaaac aagagattcg agtgagggtt 180
gaaaaggatc ccagaacttg gatttagcat atcaggtggt gtcgggggta gaggaaactc 240
attcagacct gatgatgatg taagttagct ttgtatattc ttgaaacacc tataaagttt 300
tatttaccga ttgaatactt aaatgtaagt gaaaatctaa tagatgttta tgtaaatcta 360
ggtagacatc acctcgattc cccactctat tgcttacctt tttgttttgt aatttgatca 420
gttcaagtta aaacaattta accaaaaact atgaatgttt atgatataat gaaatgattg 480
ttaactttcc tattgctttt tcacacacct ataaaagtaa tttcattact cccaagagaa 540
atcactaaag gcagaattac tagaggtaaa aataactagg gttggtacag tattactcag 600
gagaagtcaa gaggagaaaa cttgtcccaa tgattcaaaa taattttggc atgggggggg 660
ggagggaaaa aaatttggct tccttt 686

<210> 164
<211> 706
<212> DNA
<213> Homo sapien

<400> 164
ttttttttgt ttcatttgct gcttaaaata aaaattataa attagattta aatggagcac 60
taattataaa acagattgca agtaccacca tttgaaaaaa aaaaaaaaaa tcagtggatt 120
tccataacac agaaaatgca tggacatgca tctacagtag agttaaaaat ttcctgtgac 180
taaaaaatta aaaactggaa tcaccagtag caaatgtata gtcaatggct atgacaagaa 240
cagatcctgc cgagctcata aatgcaatta ttggcttttt tgctttataa aaaagacatt 300
acatatttta ttgcattatt ctcctaataa aaaacatact accacgtagc tctccccatc 360
cccattcctt gcttccagat ttttatagaa aataactgtt ttagtctggc cttggaaagt 420
gaacccaaca gcacccacct cacctactca ctcttcaatt caatatgcac atagcaaaag 480
ccaacacttc aaatctcttg cccacatcaa aaaaagtagt ttcaggagaa aaacattaat 540
accagttgaa taaaaataag ggcataaaag ctatgagaga gatagctctg ccatctgtct 600
ctgggctaaa aatcaaggct aactattgcc tttggcacca caaggttcaa ggtccatggt 660
tttattagaa aagtccccac aaaaaaatta aacccccctc acccca 706

<210> 165
<211> 427
<212> DNA
<213> Homo sapien

<400> 165
tyywgggcaa ttaggcagga gaaggaaata aagggtattc aattaggaaa agaggaagtc 60
aaattgtccc tgtttgcaga cgacatgatt gtatatctag aaaaccccat tgtctcagcc 120
caaaatctcc ttaagctgat aagcaacttc agcaamgtct caggatacaa aatcaatgta 180
caaaaatcac aagcattctt atacaccaat aacagacaaa cagagagcca aaatcatgag 240
tgaactccca ttcacaactg cttcaaagag aataaaatac ctaggaatcc aacttacaag 300
ggatgtgaag gacctcttca aggagaacta caaaccactg ctcaaggaaa taaaagagga 360
tacaaacaaa tggaagaaca ttccatgctc atgggtagga agaatcaata tggtgaaaat 420
ggaaaaa 427

<210> 166
<211> 124
<212> DNA
<213> Homo sapien

<400> 166
accatgtttt cgttgtgtgt gagcagggaa gggaactttc ctgccttatt taaacctggg 60
ccgaggattc gtggaatctg cttgatcaga gactctgggg ccaaaaacgc atcatacttc 120
ttgg 124

<210> 167
<211> 232
<212> DNA
<213> Homo sapien

<400> 167
tctgcatagc aaatatgatt taagaattta acatcattat ttgatcacaa gcgtaaatat 60
gtcaccatca ataatgtaa attcattgta caaaaattcc caacaactct taatacaaat 120
atggtacatt tgacagtttc tgaaacagat tatttttaaa actttttaaa acctaagctt 180
tatttttttc ctggttatta gacacacaca aaaaaaataa aaagaggctg gg 232

<210> 168
<211> 677
<212> DNA
<213> Homo sapien

<400> 168
tttcacaatt aaccaacatg caaaaattct cagactaaac actgagaaat tcttcataca 60
atgcatttgc caccttattg catttttaaa atctttattc tatagtgaat tggtattccc 120
aatctgccta agcaaaggca tgcccttcta acaagatttg cttagagcag aggtgataga 180
aggaaggatc cgaagaccct ctggcatggc aatctgggag cagcacattg ttgatggagt 240
ccaagtgagc acatttcaca caattcattt agtgacaagt gggcttgctc ccttttcatc 300
caggaaaaaa actactcaca gaccactgcc cagaatctgg aataagaacc ctcattttaa 360
ggtattcttc ccaacaaata aatatctaaa tattgacagg gggcatatca gaaaacttaa 420
aagacacaat aaccaaaacc aaaaccctct tcaaaacaag taagcaatgt ctgtatttag 480
ttcactctaa aacattctta gctttcttg cagtttgttc ctaaaagatt tgattgggca 540
caagaggaac caaattatta ataaaataaa agcttatttt tgtttttgct gtggataatc 600
ggtacaaaac gtttccagat ctgagactta aatggatctt ttaaggtgaa aaggagaatg 660
ccaggttcta ctgaaat 677

<210> 169
<211> 635
<212> DNA
<213> Homo sapien

<400> 169
ttaagaagac tgggcattta tactctctct tgctagtcag cctggagcaa gcttggagca 60
gacgcacatt tttgtactgg cacatatttct tagacgacca attatagttt atggagtaaa 120
atattacaag agtttccggg gagaaacttt aggatatact cggtttcaag gtgtttatct 180
gcctttgttg tgggaacaga gtttttgttg gaaaagtccg attgctctgg gttatacgag 240
gggccacttc tctgctttgg ttgccatgga aaatgatggc tatggcaacc gaggtgctgg 300
tgctaatctc aatacccatg atgatgtcac catcacattt ttccctctgg ttgacagtga 360
aaggaagcta ctccatgtgc acttcctttc tgctcaggag ctaggtaatg aggaacagca 420
agaaaaactg ctcagggagt ggctggactg ctgtgtgacg gacggggggag ttctggttgc 480
catgcagaaa gagttctcgg cgggcgaaat caccccctgg tcactcacat ggtacaaaaa 540
tggctttgac ccgctaccga cagatccggc cgggtacatc cctgtctgat ggagaggaag 600
atgaggatga tgaagatgaa tgaaaaaaaa aaaaa 635

<210> 170
<211> 533
<212> DNA
<213> Homo sapien

<400> 170

ctgtgatctc acaagtgtga aaaatcttat gaatgtaaaa tgtgtggaga ttcttctttg 60
tttttagctt ccactttggg aacatgtcaa agcacacatt gagaagtccc atgagtgaaa 120
gagatgttgg aaagcccttg aacttggtcg ttaggaaaca tccacactga agaggaacct 180
gactgtatgg aaggtcaaaa aggctgtatt aatttacatg caaaaagtca cactagagga 240
atgccatatc agaatgcttt tggtaaatat acatgtttta aagaggttat atatcattaa 300
taaaaatatc tagctggtct gaagaccctg agttatctca attgttcacg gttacagatg 360
gaactcttta ttattgagga gttccactct ttccccoatt tgtcactact acacttccct 420
agtctttaaa acaattttag gctgggtgca gtggctcatt cctgtaatcc cagcactttg 480
aaaggccgaa gcgagtggat catttgaggt caggagttcg agaccagcct gga 533

<210> 171
<211> 568
<212> DNA
<213> Homo sapien

<400> 171
cccttgacaa actttccctt aagtattgca ctacaagtct aagacacttt tcactcaaag 60
ttccttcctt ccttacctct cttttaactt ggagtcagac tttcatcagt ctgacaactt 120
ctccctgtct ccttcctttt cccccttca caagcatttc accctaacaaa ttttcttatgt 180
gcttaatccc ctcttagaag cagatgccaa gatgggatta agcacataag aggtcctgga 240
ctaatacaat gacaaaggct cccctgaag catcacacta aaaggaaaaa aaaaaaaaaa 300
acctagccat tttacattaa ctatttctaa aatatagtat ttgcttccct atttgctaaa 360
acaaaatata ctaaacatga ctattccaaa aatctgtagg gtactaagaa tatgaagaga 420
ttcactctac ttcagggat ggagttgtag tagaaaaggc tttgtgggg gagggtggtg 480
tttgaaatgt actttaaaag ccatcctcaa agcctcgagg gctatacctg gcctggtgat 540
tatccaaggg cagtccattc aaacaggg 568

<210> 172
<211> 167
<212> DNA
<213> Homo sapien

<400> 172
ccatttacag gaatcagcca cttcagttca gacagcttta ttaaaccgcc tggagcgaat 60
tttcgaagca tgttttcctt ccatacttgt ccctgatgct gaagaggaag ttacttccct 120
gaggcacttg ctggaaacaa gcactttgcc aatcaaaacg agagagg 167

<210> 173
<211> 391
<212> DNA
<213> Homo sapien

<400> 173
cctcccaaag tgctgggatt acaggcatga mccmccmcgc cctgatgata gacacgtttt 60
taacttctaa aaatatatga tcatgattgt gtctgtggag acttgccact atactaaatt 120
ttaamcaatt agagatattt gttcattacc acattttggg agtcattatt tcctctatga 180
agagagaaag gcatttgata caagttcaca ggggcttcca gtagattgag acttttattt 240
ctagctgagc tgctgatgta tgaatttttt ttgktattat gactttcata tgtattaaaa 300
ataaaatgaa aaaacaaggg attaggtgag gaacctatac gtctctaata tgcaaaatac 360
cacagmaata atgactgktg ggaaaattag g 391

<210> 174
<211> 474
<212> DNA
<213> Homo sapien

<400> 174
gaactcagag agaggattgt caccettggc atctgagctg acactateag gacaatgagg 60
agtctccttg gggatagatg gggagatgga aggacgatgc ctgtcctacg gggtcttgga 120
aggttagggg tacacactgt gagctgccac aggctcaaca gtacggatag ggggtgctgg 180
aaccagccag ggctctgatc accaagctat gtgccccatg [illegible] [illegible] [illegible]
cactgaacca cccagccaca agcctatctc cccatacagg gcacctttaa aaaaattatc 300
cttacagggg aagacgggga ggaaggatga actgtgtgcg gtgatgttgc agtgagtgtg 360
agtttgtgtc cgtccgcttg tatgaggccc tacctttttac taactagccc ccaactttca 420
ttatctcccc tttttctgtc taccettctg ccttttaaaa gtggcttgca atcc 474

<210> 175
<211> 655
<212> DNA
<213> Homo sapien

<400> 175
ccttgcaggg gtgggggatgt gtgggcttgt tcactgttac agccccatgta taccttgaagg 60
gcaacatgta cccacaaatg ttccaggagg taaataaaaa atacaattca gcctcttcta 120
accatccctt gttgatatct ctgctacttc cgaaagttaa ttcattattt ggactccata 180
atttttccta ttaattcacc ctatgtccaa ctccaacagt gaaaaaaatt tatttaatct 240
ttgcaataag cctatagcca ggcagcatta tccteagtct gcagataagc taaggctcag 300
agaagcttgt atactgtcac ttaggtagta attgcaagag ctggcattca gacccagact 360
gtgggactcc tcactccatt ctctttcccc ccactaggct gctccttaaa atacaatgga 420
tgcttgatga acgcttgtgg gaatcctggg tggacacagt tcctttttcgg ccaaaagcac 480
cctgacgact tgtgaagaat taatctggaa aacttaacct atttataaaa acgtgttatt 540
aagggcaggt tattccccacc cccttlacca aagaaacccg ccctgaccct tttttactgg 600
gggttggtct tgggcatttt caacaagggg ggaacagttt aaaaattccc cccttt 655

<210> 176
<211> 660
<212> DNA
<213> Homo sapien

<400> 176
cctggtcaaa gtgggcatta ccattcaagc attactagac atcaccgtaa cgaaggctct 60
gttcacatga aactacccct tctccattgg gggctcagac tctgctctca tccaggatcc 120
tgaactctgc tccaggcacc tgttcaaccc tctctcccac ccactgcctg tcacttcact 180
gactccagtt acattgaaac aautttcagt ctaagggagg attttctacc tttcagagct 240
gacctccgac tttaagactt gacaggtatt tatcttgaaa ccagagaggg agctggagga 300
aaaaaaaact gagcaagcac atcaatgcct ttccccaccct tcttcatcct ttccacactc 360
accgactgcc attaccaaaa cgccaagcac aaccggtttg gaacaagacg cattccgttt 420
taattaaaac caactcatta tgtattttcg tgggggggaa gggggcaca atcagggttt 480
tcaccaccaa attttccaca cggtttctga acaccattgc cttttaaaaa actatttttc 540
cacctccaaa atatttattt aaatttttatt tattacggag gtggtattct tcctttggga 600
gccaaattgg gaaatttagg gaaccttttt tattacccgg ttttttgggc gggtaaaccc 660

<210> 177
<211> 459
<212> DNA
<213> Homo sapien

<400> 177
ctttttctct tcctctgtgg aatggtgaaa gagagatgcc gtgktttgaa gagtaagatg 60
atgaaatgaw tttttwattc aagaamcatt cagaamcata ggaattaaaa cttagagaaa 120

tgatctaatt tccctgttca cacaaacttt actctttaat ctgatgattg gatattttat 180
tttagtgaaa catcatcttg ttagctaact ttaaaaaatg gatgtagaat gattaaaggt 240
tggtatgatt ttttttaat gtatcagytt gaacctagaa tattgaatta aaatgctgkc 300
tcagtatttt aaaagcaaaa aagggaatgg aggaaaattg catcttagac catttttata 360
tgcagtgtac aatttgctgg gctagaaatg agataaagat tatttatttt tgktcatgyc 420
ttgkactttt ctattaaaat cattttacga aaaaaaaaa 459

<210> 178
<211> 720
<212> DNA
<213> Homo sapien

<400> 178
ctgcaagctc ccactccttc catttatctt aacgcccagg ctgacttcta agctgctttt 60
cacttttcta cctccactgc attttcgccc ctgataattt ttgtaagctt acctaagcct 120
cccttctttt gagatccccct tcttaaaagg gtccattcta ttaaccctac cccatatcca 180
gttactttta ctacctgctg atctatcgct accttgtcca atttcatggga atttacaggt 240
gcactgggac aagagtaaaa tgatccaaca aacataatgt tgcatttaaa aaaataagct 300
aaaagatact gatgactttt tataactaca acatattcgt ttgtgaataa gaacatatat 360
agtaaaaaga tgaaaatgtg aacaggttga ctatttccta aatttatggt agaaagtttt 420
tctggagagg atgggaagaa aaaatgaagg ctggcagtga tgggtgggga aatgcaacct 480
ccaaaattat ctatctatat atttttatta aaaacaccca cagtaattat ggcaaatgtt 540
aatggtttgt ttgttctaag gttttggata catttaagat ctcttgcttt ctgggtacca 600
tttctttctt tttctttttt cttttttttca aattaattcc aaaagactta tatctgctac 660
atgaagaacg aagcaagttc agctctcttg gctgaaatgt tcaaatgctt gagggcaagg 720

<210> 179
<211> 427
<212> DNA
<213> Homo sapien

<400> 179
ctgtgaatct gtctggttct gaacttattt tttagttatt ggcaatcttt gtattactat 60
ttcaatatct tcctggtttt atctaggagg gtttgtatatt tccaggaatt tatccatctc 120
ttgtaagttt tctagtttat gcacataaac gtgttcatag tagccttgaa taatcttttg 180
tatttctgtg atatcagttg taatatctcc catttcattt ctaattgagc ttatttgaaa 240
cttctctctt cttggttaat cttgctaatg gtctatcagt tttatttatc ttttcaaaga 300
accagctttt tgttttcattt atctttgta ttgtttttgt ttgtctcaat ttcatttagt 360
tctgctctga tctttcgttat ttctttttctt ctcctgggtt tgggtttaga ttgttcttgg 420
tttctct 427

<210> 180
<211> 728
<212> DNA
<213> Homo sapien

<400> 180
caaacacaaa agtcactgtg tgtgtgatgc ttctccaatt ccactcatcc tggctgccat 60
tcatgcacta gtgcatgtat gcatttttac atttttaaa ttacaaaaat caacctatta 120
taactgctta gatatatatg aagtaaaaac gaaagttctc cctttacatg accccatcccc 180
catcatttcc ctctttatct tatactgtca gcattcccag cttgtagcac agtgtctggc 240
aatagtaaat cctcaaaaaa tgatcaatga ataatttaat aatgattaat aaataaatta 300
atgatgatgg tgaagataaa ctttagcatt tattgaacgc taactacaaa ccagggagtg 360
tggtaaatat tttataaaaa tcaatgaatg agctaaaatg ccattctatt atttttttgg 420
atacggttta atattttact catagatatg cttaaagaat attataatta tatgacttag 480

aatggtaaaa caatatgtac agcagtatcc tatttttag aataaaasta taaatatgtg 540
ctcacatatg tggttggggc atgcctagaa acccgattag aacgggattt ttttcttacca 600
ccatttttttt tacctgggaa aaatatggga aaatttttatt tcccttcttt ttggtttctaa 660
aatttatata caggagccta tttggctttg gataaatcat tttaaaaaag gtggtttaaa 720
aaaaaaaa 728

<210> 181
<211> 546
<212> DNA
<213> Homo sapien

<400> 181
acaatccttt ggaagacact actgggcttt gggtgctgct ttttaataat tgagttattt 60
tgagcttgcc aagtaggatc tattgcctgg actaaaattt atttcctaat cttctgatga 120
ccaagaaagg aaaaattaag tttgcagatg ggagatgaaa tatagccagc gaatatgcat 180
actggtttctg aatgaaaggg attaactttt cagtcaagaa acagtctgca tgccgtaaat 240
tgaatttttc ctgcaactgg aatgattggt taattctttt tgaacactgg cctttctccc 300
caagaacact aatgaattgc taatattttt taaagaaaac tggtttttta attaggtaag 360
ctccacttcc tcttattttt taatccctaa agaaaactgt taaaagggaa tggatctatc 420
acgccttttc ttttaaaacc accttttttaa aaaaggattt ttccaacccc caatttgctc 480
ttattttaaa attttgaacg ccaaaagaag ggaaataaaa atttttccct taattttacc 540
ccctta 546

<210> 182
<211> 333
<212> DNA
<213> Homo sapien

<400> 182
ggccactctg actggtctg ctaattcaca tgctctttgt gacatacggc tctaagaggc 60
agaggctgga agagaagtat gtgggttgtg ggatcaagat accccagttt cagtcttgac 120
actgctattc cttagtcagg tgacccactgt aacttcatct tgattgagcc tcagatgtct 180
cacctgcaaa atggagtttg aaatttgcta tggttgggtg tcacacggat taaatgaaat 240
aatgcctgtt aagcgcctat ccagcactta ataagatggc cactgcatca taatgctttg 300
ggcacaagta acacaacatc caacccaaag ggg 333

<210> 183
<211> 393
<212> DNA
<213> Homo sapien

<400> 183
ctgaatttct tgggctttat gtggcagtgt ggtaaaaata tatgatcaga tttcactgtt 60
aagaaaattc ttttcagcaat acatgtagag tcaagtttct tgcatggata actgaacatg 120
tgggttatga gattttaaaa aatgtctcgt gacaaacttt acggaaatgc aacaatctgg 180
acatctagtt ttgtctgaga gtggcgtgga tatgaagaac tgtgctgttg gtgctgatgc 240
cacactaagt tttggcagtc acactcttgg ttcttcatat ttgagggagat gggatggtga 300
ggaggcctgt tggctttatt ttattaggtg ccaccatcta gaatacagat tcttggatat 360
ttcatcttca caaaggtgaa gctgcaaact cag 393

<210> 184
<211> 700
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(700)
<223> n = A,T,C or G

<400> 184
ccaggacawt gaggaaaagr gaaagaatwt arrggatwtt caaatggaaa aaraggaagt 60
ccaaattggt cccntgttkg ccagataacc atgattgkgk atttagaaam ccccatgwty 120
tccgcccaaa atctccttaa gctgattaag camcttcagt aaaktctcag gataaaaaat 180
caatgtgcaa aawtcacaag crttcctatm cgamcaatam cagmcaaaca gagccaawtc 240
atgagtgrac tcttattcac aattgctagt aagagaagaa aatmcctagg aataccactt 300
mcaagggatg tgaaggwtct cttcaaagaa gaactacaar ccrctgctca aggaaataag 360
agaggmcmca agtaaatggg aaaagcattc tatgctcatg gataggaaga atcaatcccg 420
tgaaaatggk gatactgccc aaaataattt atagattcaa tgctatcccc atcaagctac 480
cattgacttt cttcmcggaa ttnggaaaaa tctactttac acttyatagg gracccaaaa 540
agaagcccwt gtagccaaga caatcctagg caaaaagaac caamcctgga ggcatcacag 600
tncytgactt cmaactatwc taccaaggny tmcrgkgmcc aaaacagcac ggkacntggt 660
mccaaacccg acwtwtwgac cmmcagacac agaacmgagg 700

<210> 185
<211> 192
<212> DNA
<213> Homo sapien

<400> 185
ccagyctttc ttttaagtaa gcgctttttc aagctcattg tagctacaaa gtcaataaat 60
tggtctttgt tatttttacc tgaaaaggct gttaaaggtt aaaatgacaa actcaaattc 120
aaagggattg gaggatttgg tgtttatgat ttctcagaac aacaatctag agaccaccag 180
ggtgggtttc ag 192

<210> 186
<211> 688
<212> DNA
<213> Homo sapien

<400> 186
gtgctggaat tcgcccttag cgtggtcgcg gccgaggtgg gatatttctt ctggatagat 60
ttcagatggg tagttccctc aaataagatt atatgggttt gcattttcaa ggcagagttg 120
tatacttcct gctctttatt taaataaaaa aacttgaaaa tctgttctgc ccagtattgt 180
aagcgctcag gtacaaatat gaatgaaaca atctctgcct aagtaacaca agtataggga 240
caagattctc agtaaaattc tcacgtgaaa tttgtaactc actagacact atcaggagat 300
caataattat gtaattaaaa aaaataatta cctgccaaac tgggttcttc tttggcactt 360
ctgcttggtt ttaagacaat tctcacatag aagcttatta ttccccatta gtcattccat 420
agatgtaaaa ctggtagaaa caggacttga attgaacatt ctttacaagt aagttatata 480
gcttctgaaa aaagggcttg aaaaagcatt tttggggact atcagaacct tcaaatgctt 540
tcccctctta acaaacctta aaattatttt gaaaataatt taagggggct gattttctct 600
tgtcaaaatc ttgaacccca cttaccaggt ggttggtcaa accaaagttc aaaaaaaagc 660
ttctggcctt tcctttatcc cacttgca 688

<210> 187
<211> 779
<212> DNA
<213> Homo sapien

<400> 187

gcaaaaaaca gatacatttt cagtgtttaa aaatgaacaa gtatggaaag gcttatacag 60
taactgaaaa gtctcctttg ggaagccaag gtgggaggat tgcttgaggt cagpagttca 120
agaccagccc aagcaacatg gcgagacccc atctctacaa aaaattaaaa aatcagccag 180
gcatggcgga catacttgta gtagtaacta catgggaggc tgaggcggga ggatcacttg 240
[illegible] tttgaagctg cagtgagccg caacgcgccc tgtactccag cctgggcaac 300
agagcaagat gctgctctaa aagaaatttt ctttaaaga [illegible] 360
tgttctacaa aagtcctatt tcttcccaca aaaagcctct ggtacctggt gttagttcct 420
ggggtggaag attactttta aaaatagaac tattttttaa gtatatcttt caggggacct 480
tagttcccga agctttaggg aatgggatct tgaaaacaaa agggatttca atacctatga 540
caatgcttaa agaattattg gggcatttat ttttcaatgg agggtccaca aatctttgga 600
aaccottggc caattaccag aagccacttt aattttgac cgaaaatgtt tttaaaaatt 660
ggcttttgga aaaactgtct cttttccccca aaatgaaacc cttgcaaaaa aggggaattt 720
ttaaggttgc cccctcatta aatttaaacc cctctgaaag aaaaccctct tgtgacagg 771

<210> 188
<211> 394
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(394)
<223> n = A,T,C or G

<400> 188
ggcgamgtct ggycaccatc atgcccttta atcaactcac acctgtttaa agagtgtttc 60
tgatttgacc tttcatccctt agtttactgg cgttaaaaaa agtctcagca attttcatta 120
ttttctcgtgg gtctcattat caaaccttta cttactttcgg catatttcct ctgggcttct 180
tctagtttct gccttacaag caatgctgtt ctgtaaattt attgaaacct ctggaacatt 240
tcacctttag agatggaggga tggaaggatt ggyaccagaa gagggctaag atacgttytc 300
tgtcttngag ctgaaagcac agyctactct cctttcgtttt gycgatgaga aaagttgagg 360
ccagaaggga ggtgacatgt ttagagtcac ccag 394

<210> 189
<211> 681
<212> DNA
<213> Homo sapien

<400> 189
aagttctgac tttggtctat aaaacagggt tattggctgt ggctgcactc aatatctaaa 60
aagttattag gaagtgcctc gttattgtca ttaaagatat ctaaatatgg tagaccaaag 120
gttgttgaga aacacatatt atggactgag ttctgtttct tctgctgtgg cgcacctaag 180
ctcaagcctt ccttctctcc ctcccnttct ggccggcatg gtatctgagc tcacagacag 240
acaggcatg ttagaatcat cagatcatga gcaccgtgct gggatttagc cctctccaaa 300
gtcaattctt acagtccata ctttgcttaa atcctcagtt gttgaggtct gctctgctgt 360
cagtaatccc agctataaat ttcccccaaa tgtggggcct agataaagta gaaggtggat 420
ggactcagtt tattttcatg ggatgacagg aactggaaag agaaagggca ttgaaaataa 480
aaagttattc cagaatagca ttaaccctct tactgttcaa gaattaagaa agcctactta 540
gaaatgaggg cttgagaat gatacccaaa tattggtctt tctaccaaaa aatggccttt 600
ccaaatatct gctttcctgt tccccaattg gctttttaag tagaattaag ttacctaaaa 660
ctttacctga agggtggttt t 681

<210> 190
<211> 239
<212> DNA

<213> Homo sapien

<400> 190
caaatacatg atttccattg gcatagactc ttctatagtc tctcaggcac accttatgac 60
taataagaac actgtcttct agatataagc caagttttag gagttatctt tgtagtttct 120
gtgttgagac tatgggtctt ccctgtgcaa agacttgatt agcaaatact atttgaaacg 180
atcccaaatt catagtgcag ttgaccaccc ttctgatcaa ggggatctct gtatatccca 240
tgaaagcttc ataggtctca ccctagatta agtgcttcac ttctcaagac agtgaacaga 300
tggaagactt ttgtagttat cattatacaa ctctgccctg tgtattttat tatacaacca 360
gagaactgag gcactggctt tacctgtcag ctacgccagg ggtgtgacgt catctttctg 420
acttgatcac acatgccaca ttgcttaata tttcaagcct agactgaaat aatcctgtgg 480
taaaaaattt ttgggggct ggggaggtaa agaacaaggg ggggaacttt ggaatatttt 540
tattcattaa tcatatttcc caaattgtat tttattttga aatgaccata agggacttaa 600
atacgtattg tggttaaatt aaatggaccc aaatggaggt aagtaaacct aatgggacaa 660
atgaataaaa ggtttatgac tgggagcatt tacccatgaa cctccttaga agctatttaa 720
cctttctttt ggaaagccct gaaggctggg aacttaaatt ttaaagacag tacctatttc 780
cagaatcgct tccaaatggc catgttttaa agggcaaaca ttttgggatg gccctgccc 839

<210> 191
<211> 697
<212> DNA
<213> Homo sapien

<400> 191
ccatcctgaa tactgatttt ctaatggaac tctattcaat ggcgattgta aaaccctgag 60
gctccgttac tattatggag catactttca tctcattctc ggctattggg caatatgtat 120
ctcatcagat tttatcacat ttcacagatg aactgttaat tgattccatg ggtacgatta 180
ggcgagatcc aagctggagc tgcagctctg agtcccataa attctttgtg cttctgtaaa 240
gaataaatct gtttttaatg caaattaaaa ctactggcag ggaattttgg ctcccagtta 300
ttaaaagact ggaaatgtgt aagtggagaa aggcactaac tgcagtaatc tcttaccgga 360
ctctattata attccaaaca tacataatgg tgagaaaaac cgggaaggga agaatgtggc 420
aatgtccact ctttgcccca aacataaccc ttaatttcca tggcgggccc aaacactggt 480
aaaaaccaaa atggtaccct ctatagcatg caacttttat ttcactccaa acgaaaaatt 540
attttgacta tggcttggga aatccattag tagaagaagt tttataacct ataggaaccc 600
ggccatttca tttctaccaa atcacaggaa ttttagaatg ggcaaggaat ttacaggaag 660
acttgcccaa ttatcttttt ttgggggact aaaccaa 697

<210> 192
<211> 687
<212> DNA
<213> Homo sapien

<400> 192
ctggttacta tagctttgta gtataattta aagtcaggta atgtgattct tcccgttttg 60
ttatttctgc ttaggatagc tttggctatt ctggatcgtt tgtgcttcca tataaatttt 120
aggatagttt tttgctattt ctgtgaagag tgtcattggt actttgatag ggattgcatt 180
gaatctgaag attgctttgg gtagtatgca cattttaaca atattgattc ttccgattaa 240
tgaacatgga atgtttttcc tttatttggc gctctcttta atttccttca tcagtggttt 300
ataggtttca ttatagagat ctttccttct tttgggtaat tcctacgtat ttaatttatg 360
tatcgctatt gctaaatgga atgacttttt aaatttcttt ttcacattgc tcctggtggc 420
atattaaaag ctactgatgg atggtgattt tggattctgc cactttactg gaattggtgg 480
atcagttcta atcgttttct tatgcacccc tttacggttt ctacatgtaa gaatatatca 540
ccttcaaaca cggataattt gactctttcc ccatccaatt gggaggccct ttatatcttc 600
tcttggcctg aaggctctac ttaaaacttc ttatcccttt gttggaataa cagtggggac 660
aaatggacat cccctgtcat ggtccca 687

<210> 193
<211> 493
<212> DNA
<213> Homo sapien

<400> 193
ctgctaaaat gatgttgcta aagcattcct ttttcttttg attaaacttc atgtttacaa 60
aaaaattcat tctagcagaa taacgaatgg ttttgttttc tagttctctg ctgaatgaac 120
agttttgcca attatcttca tagagtagtg atataatgaa tgcaacctca aatgcaaacc 180
aaccaattca cagtccatac cccaatcact tccttcatca gcctcaaaaa tcgctaagtg 240
aaccagtaga atggttttgg agcagtaata ggaaagcaaa tagaaagtca aggggacttt 300
tcaacgccaa caagaccaat tcagatcctg atctgactgg tttctaatac aatctctttc 360
cagagtaatg gagcatgagt ctgccacaca gaactttaga gagagtcctt tatttcaaag 420
actgtaaagt tggaagaact cattcatctg caaagtcaaa tgtcaaaagt tgtgcttccc 480
actcctcatc agg 493

<210> 194
<211> 424
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(424)
<223> n = A,T,C or G

<400> 194
cyagggcant tnagcangae aaggaaatan mggggattca attagggaac wraggakarw 60
caagttgtcc atgtmtgcag atgmagtgat tgtatatcta gamcacccca ttgtctcagc 120
ccaaaatctc cytaagttga taagcawctt cagcarmgtc tcaagatacr acmtcwatne 180
gcraaantca cmwgcattct tatacaccaa tawcagacaa acagagagcc aaatcatgag 240
tgaactccca ttcacaattg ctacnmaaga gaataaaata cctaggaatc caacatacaa 300
gggatgtgaa ggacctcttc aaggagaact acmaaccact gctcaaggaa ataaaagagg 360
atmcaamcaa atggaagaac attccatgct catgggtagg aagaatcaat atccgkgaaa 420
atgg 424

<210> 195
<211> 229
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(229)
<223> n = A,T,C or G

<400> 195
tgaacaccct tnggaaggaa cctgctcgna tgtannanaa anggaccgga cagtctgcta 60
aaatcgccct ctttagacgc ggcgcgcngg ggcagagttt ctctctggtg ctttgacctg 120
tatttggttt aatggttttg tcctaatctc ttcaatcaat aaaattgtgc gtatttaact 180
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaa 229

<210> 196
<211> 557

<212> DNA
<213> Homo sapien

<400> 196
gcggtggctc atgcctgtaa tcccaccact ttgggaggct gaggtgggca gatcacttca 60
agttgagagt ttgagaccag cctgggcaac ataacaaagt gagatcttat ctctacaaaa 120
aaattaaaca aacaaaaaaa caaatcaaca ttcatttgca gggctctttg gtcttcttaa 180
agaacaaaca tatgaaataa ataagctgat tcttaaagat aacaaatata atgagctttc 240
tcaactgtaa aagcatctct aagttgttct atcaatgcat atccactcca tgaactaacc 300
tgaagaaagt gttgaccatt ctacccaatt aactgtaaac taagattgct ttaatggttt 360
gcctaaattt gagtaccttt aaatttttgc tttttatcca aattcattct cccttcttca 420
aattaaatag ttttgttaga aatcggataa gcaagatgta ctttttagaa agggcaatag 480
aatcctacaa catgctagaa tttgaaatgt tttcttaaat cagtmmtttc tctatgctag 540
taactaagaa aattata 557

<210> 197
<211> 624
<212> DNA
<213> Homo sapien

<400> 197
ttttactacc tatatttaaa atgatccctg acgcccctca agacaaatat attaattttt 60
ttactttgtg ggatagagat cagaaaaaga gtagagatga aaatactgga gaaacaatgc 120
aggagatatt tatgaggtga gaatgtcaag aaacttgtaa agggagaata ctataatgac 180
ccctgaagag agagctttag acaagttgag tattagaggt tgccacgtgg ctattcatcc 240
actaataaat acaagaaatt actaaaatgg aagccactgg aaatatgttt tgaggaaggt 300
gagaatgtgg acctatttta aatgggtgaa tatgatttct ttctcattaa gttcataaat 360
aactttcaga catgtaacag tttatgaagt gtgcctaagt catttagtat aagttttata 420
cacaaaagtg tttttactaa gactgtcaca ggttcttttg tgaatcttgt ttgtttttcc 480
tcattgtaaa tactgcaata gaacatttgt gtcttaacat aaggcaataa acgaccttaa 540
gaaccttcac ttttatatag aaagtggagg aaaagttggc agagtaattt gttgattata 600
gataaaagct cttgtagaaa ttgg 624

<210> 198
<211> 175
<212> DNA
<213> Homo sapien

<400> 198
tttttttttt tttttttttt ctaacactta tgcatttatt ttcatgtgta agaagaaaaa 60
cgtaactagc acgtgaacat gactgcatgg atacacggct cagcacgagg ctaaagtcag 120
aagtgagtga aagcaaaacc gcatgttgat ttaagtgaaa taacagaaca gaaaa 175

<210> 199
<211> 871
<212> DNA
<213> Homo sapien

<400> 199
ctgttgatca atgatgagct cccaagagta accagcctct atatagtcag catcactggt 60
ttctcaggaa acgcatcacc attgttcatc ttgctgcaaa atgtatgcac aagtatcttt 120
ttatttttaa aaaagccctg acattttatg actgctgctt ttctaagata ttttcaaata 180
tacagtccat acggttcaga cacaatggac tggggataga gacggctata gtgccgataa 240
tggagaaact agcccgagct tcagatattt gttttccagg acatctcaat aattgggtac 300
accccacaat atgtgagact tgacgtcgag tggcacggca tactctggcg caggcacttg 360

ataaagactg tgtttgcaaa tacttagcct gcacttcaag ataccaggca tctaagcacg 420
tcccagatgg tgacagttaa tcttcaaaaa accctatgtg gaagtattat cattgtcctc 480
attttacaga tgaggaaaaa gaggcacagg gatgtcaata tcttcctcaa ggtcacacag 540
caagtaagtg atggaacagt ggctcagcca tgaagctatt gctgttaacc actaggttga 600
tttgccttca ttaatttctt cctaaaactg cacatttccc gttagtccct cttttggtc 660
tgtcgtttga ctcttggcta [illegible] 720
taaatatgtg caactccttg gggacatgac caggcaaaag ctggatacag aaatgtatgc 780
ccaaacacca tcccaagtta cccctaacag gtctttcctg gaccctgttt gtaagggggg 840
tatatttgga aaaattttta aaattttctg g 871

<210> 200
<211> 737
<212> DNA
<213> Homo sapien

<400> 200
gacattttga aggtaacagc aatatctgtg tatagatggg gttgtggttt tgttatttat 60
ctgctattgc tgaactatcc tttgtcttga gcgataaaag agaagtaaaa tactaaagaa 120
ctgaactgtc catttctgga ccatgagtaa agatgctggc tgtcaaactt cctgttcata 180
cattagttta tttatagagt gtactctcca tgtaaggtat tgactgataa tgttactttg 240
acttcagata gcttgcagtt taatggagga agaagacaaa catgcaaata actaggtcaa 300
tgagggcatcc tttgtgttcc attggaagct aggctgcttt gtaaccttgt taacttctgt 360
ggttttggag tgcattcatt agcaaataca ccccttgttc ttatccattc tctgcttttt 420
tctttatttg gcatttgatg acattttttc atgtggggaa attgagtcag gtgaggtgga 480
aagaaaatca ggacacgaca ctaaattctt tgatgttttt ccttaaaaaa ttgtttttca 540
agtgctccat aaagggttgt gaagttttaa gagccatagg acttggatta ttgtgaaaga 600
gtgtctctag ggggccaggt taaaccattt caaggactct ccttctctca tctcccttgt 660
tccacccagg gtggcgaccc ccaaaaagca caaagcctcc ctttcttcat gggaagggta 720
agggacggaa gggaacc 737

<210> 201
<211> 493
<212> DNA
<213> Homo sapien

<400> 201
tctagaaatg cagcttttat ttattacccc atttctttca agtccttgga aaataacata 60
ttaagggtac aagaaattaa cacatgatgg aaaagtcatt gtgacgccaa tgaatttcat 120
tgagtataaa ctcatctact tcaaatttat tttataacac aaactaagat actcaagata 180
attatttaat ggttagctct taagttgaat tggtctacat aatgcgtggg aagaaacca 240
gatttttagc cttcttgcca aatccagacc tctggttgat ttttctttga cagaagatgc 300
aagttatttt ccaatttcac aattaaatgt atttaacatg aacattattt tgctttaaaa 360
actataaaca ttgtaggaga atttatgcca gtcttcagtt ataaccactc caccctcctc 420
actttctctc tctctctctc tttttttttt gctatgggat ttaatgggaa aaatatgtaa 480
aaactgtcac taa 493

<210> 202
<211> 283
<212> DNA
<213> Homo sapien

<400> 202
ccttttttatc tcagtgacac cgtccgggga cgcaggtggt ggtgactcaa ggctagcctc 60
aaagggcagc cccacctcct catcctggac cacagagacc acctgcttgg cgcgccgtcg 120
cttttccgag agggtggctg actccggggt gctggggctg gggctgccgc ccccgccgct 180

gttgctgtac tcctcgcccc agtcgatggg ggctgccctc ggacagcagg tgcaggttgg 240
gggcactgtt acgcaagacc atgctgcccg gagaggtaga tct 283

<210> 203
<211> 713
<212> DNA
<213> Homo sapien

<400> 203
ctgcttttgc gcaaggtgcc actggacgag cgcatcgtct tctcggggaa cctcttccag 60
caccaggagg acagcaagga gtggagaaac cgcttcagcc tcgtgcccca caactacggg 120
ctggtgctct acgaaaacaa agcggcctat gagcggcagg tcccaccacg agccgtcatc 180
aacagtgcag gctacaaaat cctcacgtcc gtggacccat acctggagct cattggcaac 240
tccttaccag ggaccacggc aaagtcgggc agtgccccca tcctcaagtg ccccacacag 300
ttcccgctca tcctctggca tccttatgcg cgtcactact acttctgcat gatgacagaa 360
gccgagcagc acaagtggca ggctgtgctg caggactgca tccggcactg caacaatgga 420
atccctgagg actccaaggt agagggccct gcgttcacag atgccatccg catgtaccga 480
cagtccaagg agctgtacgg cacctggggg atgctgtgtg ggaacgaggt gcagatcctg 540
agcaacctgg tgatggagga gctgggccct gagctgaagg cagagctcgg cccgcggctg 600
aaggggaaac ccgcaggagc ggcaccgcag gtggatccag atcttcggac gccgtgtacc 660
acatggtgta cgagcaggcc aaaggcgcgc cttcgaagga gggggctgtc caa 713

<210> 204
<211> 275
<212> DNA
<213> Homo sapien

<400> 204
gtagacaagt acagcagatc cagacaccag atctagctag gctaaatgta cagtatctaa 60
cttgatctga actgaacctg tattccttga tgatgcctaa aactacatcc atagaattct 120
ggtgaacctg taatacagtt ctgaaagtac agttttatat aataagatgc tgatctcttt 180
attctttcaa gtaagagtgc tagagaacaa atttgtttac ttgccttggg atttattgaa 240
cgtctggaaa atgctgtctt cctagatcca aacag 275

<210> 205
<211> 694
<212> DNA
<213> Homo sapien

<400> 205
ctgttcctgt acatttaact gaaaaaaaag taacttaaaa taatataaaa atagcactca 60
tgtatgtcct acagttatag gtgaaatttg atattgtttg tcttacatag catacctata 120
gacagcttaa gtaaagtgac tgttaagagg gttatgctta ttgatgaact cttgtagttg 180
cttaccagct ctgttagtat agttaaattg atctcagtag cttcaagtat ttataaaatg 240
gttgaagtcc aaatacatgt gataattaca atacactttg aattaatgga gggtgggagg 300
ctagttgaaa tgcattttat ttacccaagg agtatgttaa aatgatagtt ataaatgttg 360
gaagtttaaa gcaagatact cagtttagtt ctttacaaat cataagaaga acaaaattag 420
atgttgacat tgctatttta ggctgtgtgt tttccatatg cttcttgctt tccctgtcac 480
aggtggtggc agcaatcttg gtgtgattga ggttatgctg gcaccactcg cacacgggcg 540
cacaatggtg ttagctgggc agaaagagtg gcatctctgg ctaccgggct gggggcgacc 600
tttaccatag gatgaagtaa ccttgcattc ggctgcaagg tgtactgtac cgtacacagg 660
tgctgggtcg atggccactt tctgcttttc tttc 694

<210> 206
<211> 704

<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(704)
<223> n = A,T,C or G

<400> 206
tttttttttg gnaaaaacag ggtttcatca tgtttgccag gctagtctca aactgctgac 60
ctcaggggat ttgcccgcct caccccattc aactttcgta agtcagtatt taccatctaa 120
ctcagtgtcc caaaatttaa aatttccttg cactttacag caaaaataca tattggggct 180
ctactgaagc aatatataca tgtcaaaact aaaaatcaga aaagcaaaag ggtccattca 240
acatatagca gcttatattt aaatatgtac aggtatgtat gttttcacag ttagatcttt 300
aaaaaatttt atatttgata tgttcaaaaa tacttctatt ggctataaat aatattttaa 360
aagctcaact gatcaaaatg cattccaaga acatatcaaa ttaaataaat cttctacgtc 420
tttaaaaaca gataattgaa gtcagtaaag cttgaggttt gtgttaagtg tattctgtca 480
gtccctacta ctagggaagg cagaatcttc taaatacgat acgaaagaaa ctcccaaagc 540
ttggaaagaa tcggcagctc ctgaactttt tgggggggc atccctcttc gggattgaca 600
tgcgacataa atgttgcaag ctaagggacc ccccccgggg gagtgggccc caaaaaaaac 660
cacacctccc ccgtcaatgg tggtcccccc accaacctta aaaa 704

<210> 207
<211> 225
<212> DNA
<213> Homo sapien

<400> 207
ccattttaac tgtactgcca atagaattct ggaattgtgg aaaattgtat cattgaagtt 60
cagtaggatg tgtggcttaa aaatttatca ggacccacaa aaagaaaaca aaaatctttg 120
gtactgaggt tcattgccag ggcaggaggt atttccagaa aatactcatg cctgtgttct 180
gttccttgct ttcccaaata ctgcatgtga ctttcctaag cggca 225

<210> 208
<211> 678
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(678)
<223> n = A,T,C or G

<400> 208
cctatatcta tcaaaaaaaa tccagttcct aactaataat ctcccaaaaa gaaagcacca 60
ggaccagatg atataaatgg caaatttttt caatcattta agggcaaaat aataccaatt 120
ctgtatcatt tcttccagaa cacttcctaa ctcatcgtat gaggccagca tcactctaat 180
agcaaaacca gatcaagcca ttacaagaga gagtgaccga ccaatgtggt tttattgagg 240
atgcaaacaa aatttaacat aatatttaat agtgaaaaac tggatgctct ttccctaagt 300
tagagattaa ggacaagaatg tcccttcac tactcccata caacacctta ctgaaaattc 360
tagctagctt tataaaataa anaaaaacca naaaataaaa taaaaggtgt acagactgga 420
agatacagtg aaggaggaag aaataaaatt ttctttgcgc ataacatgat tcttctatgt 480
ggaaatcaca gagatttgaa catttttttt ttttgagaca gtttttgctc ttgttgccca 540
ggttggagtg taatggcgcg atctcggctc actgcaacct tcacctcccg aattcaaggt 600
gattctcctg cccteagcct tcccggagta agcttgggga ttaacagggc atggcacccc 660

ccatgccccc agctaaat 678

<210> 209
<211> 720
<212> DNA
<213> Homo sapien

<220>
<221> misc_feature
<222> (1)...(720)
<223> n = A,T,C or G

<400> 209
atttattttga accctagcat ttagaaatga aaaacttttt ataacaatca aatacatgat 60
aaagtatgca aagagtaggа aattatttctg atgacatatg gagggttaca aaggagaaaa 120
cttttttgcta cctctgataa agaatagact aaattctcca agacccatct gactggtgtc 180
ataatagaag gaggtacaca cggaagcaca agggatgtgt gcctctggag gaaaggtcag 240
gtgaggactc agtgagaaga caagccaagg agccaggtct tggaagaagt caaccctgtt 300
gacaccctga tcttggacta accctgtgga caccttgatc ttggactttt agcttccaga 360
actgcnagaa aataaatttt tcttgtttaa gccacccana gtgtantgtt ttgttatggc 420
agccctaaca aattaaaatt atattttaac agagaatata aaattctaat ataacatttt 480
acagtaaagc attcatggtc tttttttttct tactaataaa tccatcaaaa cagaaagttt 540
tgcaaaattc taacacattt ctctaccact actgtttcta ctctcttaaa actactccgc 600
aaatataaaa atagaaggcc aaaatgcatc attaaaacga tgtttgggga ctaatggcct 660
taaaattcta ttacacttgg aaatatacaa atattcaaag attatctatt gatcacctca 720

<210> 210
<211> 277
<212> DNA
<213> Homo sapien

<400> 210
tccatgtatt tttatacaga atggaacaat atgtatgtat gcaatyktta cattccacca 60
tgaaataaaa cagtataatg aaaataacaa tagattcaaa caatgatatg ctatttttt 120
ttacctatga cattggcaag gtcttcttaa aaaatctgcg aataaccgat gttggagaga 180
tcatggggaa atagccactc aaatgttact catgagagtg tacatatgtg taacttcact 240
tggagggcaa tttggtgata catttaaaaa gttttgg 277

<210> 211
<211> 715
<212> DNA
<213> Homo sapien

<400> 211
gtggtagaaa tactaatttt gcaattacag aaaaaaacaa atgccattca catggttyct 60
aacaaaagt gtctgaccac ccccaccccc cacccctcaa aaagccctta aataaagagg 120
aagatcaaaa gaaaacaaaa taattcccga gtttcacctc atacatacaa tatagcacag 180
gaagtggcaa agtttaaaat aatgccttta ctgttaggac tagtatgctg tcaaaagcca 240
caatcctttt gttttagtga gttgattttc aatagaaaaa tacaaatgaa catgtgttta 300
agttccaaca tggattgagc accttgaat ttagtatcaa atgattaatt ttattttca 360
gatgtcaaat cttagtataa aattttccat tattttaaac ttcacttgaa tctttaaaaa 420
agctgtctaa attgtactat atgagttcag tttaatcttc tgtaaaatgc taacaaattg 480
aactgtcagc agtcttttaa aaaaaaatgg gggctgggtt atttctagaa gaactctcat 540
taagctttga aaatcagaaa tcagagacaa ataacttcag atatagacta gctccacaag 600
caaatttata caattatctg taacagtcta tacatatatg tgtatatata tataccgtaa 660

ccactttcat aggtaaaaaa tattaacttc atgtcacact atgatcagaa gtata 715

<210> 212
<211> 717
<212> DNA
<213> Homo sapien

<400> 212
agcctccccc aatgccttaa aaggtcacag tagatctcag ctctgaacag aaactcaact 60
gaaactcttc ccacaaccca gcagtagata tattaaaacc tacaattttc agggatacaa 120
ccaatattta atttctttga gggttttgtg tttaatacaa ggacacaaac acacgtacaa 180
aatgacgatg tcaatactga ttaaacagaa caacaaaata agaagctcaa attatcatca 240
gctattgtgt atatctgaaa taacaataat gcacttgatt ctgaaagaat gattagagtt 300
cctactctga aaatctaatt gtcttgatgt ggcgaagtga gaagaaagga tgatttttct 360
aatgaaaagc atgtatacgg gtagcccttt gcgagattct gtcaaaaccc cgaactttgc 420
attagctgtt ttacccaccca aacgttttta cccgaggatg tgcagcaatg ggaactctca 480
tacactgctt gtgggaatat aaatcagtat aaccactttg gaaaaccatt taacattgtc 540
aactacagct ctacacacaa gtgctataac cacccattcc actccagggt atacacccta 600
aaaatatgaa gtgcccatgt ctacccaaaa ggccgcctaa aaggaatgct tttgagaagg 660
gttaaccttg ttaattagtg gcaaaactgg gaaaacaacc cccaaatggt cccatcc 717

<210> 213
<211> 599
<212> DNA
<213> Homo sapien

<400> 213
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caaagcgatt cagcaggatg atgaccacag gagtgctgga gccgggcctt tcagcccccg 120
tgtggatgat gaccggccat ccaggacatg cgagggcttg ggacagtgga cagccagtgc 180
cacacaagga aggaccgatt aaatgacaca gttaaaggaa tttggcctag ggagtgcaag 240
ccagaaaggt ttggtctttt tatatatgta acattggaaa aaaggaacat ctcctgttcc 300
ctgtattaag ttttgacttt agctcagcaa atgcagtgtt tgtggcagta aatatactct 360
gataacaatg ttctttccca ggaatttaga gttttatgat ggttattgaa aatgtttaca 420
tgacaggctg tcaataatat tttttgcctc taaaaataaa acatacataa agtgtacgga 480
ttttaagtat gcaactcact gaactttcca taccgtaata caccacccta gtaaccctcc 540
cccagttcaa gatgtagact gtttccaata acccctcatc ctgttcctta atagccccc 599

<210> 214
<211> 789
<212> DNA
<213> Homo sapien

<400> 214
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tatgcatcat agatatctaa ttttttcatc tcttgcatga agtctttcct gatttccctc 120
tgctgaaatt tctctcttca aatgatgtgt ttccatagta ctttgtccct tttcaaagat 180
atatttcaca tcgcatattt taccacagtt agtttcattt cttaactctc acactagatt 240
acaaagtcaa tatagacaaa gaaatgttca accttatata acctcctctg cctatgctgg 300
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aaagattaaa gaccttgtag aaagtcaaga ggaagatagc aatttcactt ctaagaactt 420
acccaaaggc aacattcatg aagagataca aggggttatg tgcatggatg ttcattatca 480
tattattctt cattatgaag attatgatgg taataatgaa aatgattatc ttgtattggg 540
ccttatttga agtcaagcat tgagaatgta ctttatctgc attatctcac tgagtttctg 600
tagcagccct ataaggtaca gactgttatc taagcttaaa aaaataaagt taatgtccaa 660

ggtcaaacaa ctagtaaaag aagggggcta ggaaatttgg aacccaaaaa ggggcaacct 720
ctcaagggct atgaatcctt accattatta taaggaagct tggcccatgg tggcccaaaa 780
aaaaccggg 789

<210> 215
<211> 765
<212> DNA
<213> Homo sapien

<400> 215
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gagtctgagt atcaaagact tgtattagac agggttgttg tagtaatcta gtcagggtat 120
gagaaatggt ttgtattaga gtgtcaggag tagtcgtggc aaaaatatat agatcaggat 180
gagggatggg cctcatctca caccctgact ccagtcaatg gcagtggctc cctggagtac 240
actactatag gaaggatttt gtaaagtttt gtctggcctc agtggagggt gaggtagggg 300
agggagttcta tgaacagtta gtggtgtctg ccatggttga aacaatggag aagggggaca 360
cctttctgt gcagatgttg cttctggtag atataatcca caatgtaatg ggagaagtac 420
taagaatcag taaattatgg agggtgtaaa agactactga tatttaagcc tgcggacggg 480
acttagagaa atgatagtta aaggagaaat atccagcaaa caaagatatg acattgaagt 540
ttgggactgc gattagtacc agagatttgg attggaggtg atttgtatag aatggatagg 600
tgattttact cttgcaattt ggattgaggg gtggggaaaa ccagaaaggg gctgggggt 660
aaattagtag aaggtcacct tgaattcatt gtggtccata tcaatgctga aactgattgg 720
ggaacttttt actcttgagt cccttgtaa gggaacccca gaaag 765

<210> 216
<211> 780
<212> DNA
<313> Homo sapien

<400> 216
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gttaaagctg gaacatttga tatttttcca tttatttatg aaaaaatatg aacctatttt 180
catttgtaca aggtaattgt tttttaaagc aagtcacctt agggtggctt taattgtata 240
agtcaagcac atgtaataaa ttcaaaacct gcagttaaca ggatattaga catcaatcct 300
ggtaaccaaa tattaaagat tctctttaaa aaagactgaa catgtttaca ggtctgaatt 360
aggctaaaag gtcttgcagt ggctttttcat ggcccttcaa attggaatgg aactactgta 420
ctttgccatt tttctataaa tcagtacttt ttttttaatt ttgatataca ttgtgtgaaa 480
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cagttcaaag tgtatactta ttcataatga attataacag ttatatttct gtgtttttctt 600
gtaaatgttt cttttccctt aaatacagat aattcatttg tattgcttat tttattatga 660
gctaccacaa aaggacttca ggaacaagta atgtattagt atggttcaag attgttgata 720
ggaactgtct caaaaggatg gtggttattt taaatataaa tagctaatgg gggtggtaaa 780

<210> 217
<211> 810
<212> DNA
<213> Homo sapien

<400> 217
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attcgagggt ataggaaggg ccctgtgaag ttgatttaac ctttggatgt cagactgtga 120
aagctcctga gaaacttggg gtaataggat cttcttttgg ggatgaaaat ggggaaggcg 180
tgaggaccta gactactttct ccctaggtca gaaaagagа attacccctt gacaaatatg 240
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gatggatgga gcactcaggt tagacttgtt cctctccta tgctggagga gagggatggt 480
tctctagaat gttggaggtg agttgagagc tcgcctcttg aatgttgaac agtgtactct 540
tctgaaaact gcatattcac tttatgtggt ttcagaatac tgggctcaat actaacataa 600
gaaagacact tcactgagaa [illegible] 660
actaacccc tagcaaaatg caggttcttc atacttctgt cctttttcca ttggaagaat 720
tgcttaagga aaaattaatt cctatttatt cccacaaaag gttgggcatt gctttgattt 780
taccccatgg gggaatgtgc ctttgaattt 810

<210> 218
<211> 817
<212> DNA
<213> Homo sapien

<400> 218
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gtggcttcca agtaccggct tttgctgaag gtctacatgg gaagaagagc atcatttgat 120
attcagtaga tctgccacac ccaactggct ccatctcctg gaaaacagca ctcactacac 180
gcaactgtaa tagcacccag caatgaccac gctgctcctg ctggctcttc cgtacaccag 240
taaatgaact caccaatgta ttgcacacat acatttcaca gtagtacaat aaagccctgt 300
atcaggagtg gtaattcaat gacttgactc tatagtgcac tgcagcttta tgtcatacca 360
acattcaaat attcaaatat ccttccaatc catttggaca aaaatacacc atggctgcca 420
agacacatgt atttttcttt cttccatgga ctcctaaact gctcccacaa tcagcagtgt 480
tcttctatca gaaattatct taagcttctc tactcaatgg gaggtacaca cagagacctg 540
agaatatgca gaggccagaa tctctgtctg tgctagagat caactgtact ctgcccacct 600
ggggaacaca tcctctgggt aaagtactcg gaagtaaatt acattccctg gagacagata 660
cgggctttca ctgcagcctg ttagaaaaca caatgtctgt aagttacctc ataggtcaaa 720
gagttttgga ttatattttc cataatgggg ctatggcctt tttaccctgg ttttaataca 780
gaacccactg cagaaaggac attgaaatta aaagcca 817

<210> 219
<211> 661
<212> DNA
<213> Homo sapien

<400> 219
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aatgaatgga tagtggtatt agatgttaat gacatcagtt gtttttattc tttacttttt 180
cttagaaaca gattagtttt ctcgaattaa agaactacca tttttctttt ttctacaact 240
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aatagaatag aaactgagac tctaggaaaa agatagacat gagataagga gtaggcatgg 360
tagacatttc tagattattt atgaaaatgt tgtagaattc attttttttt ttggtctgac 420
ctttgccaat ggtgctgagg aagggaaagc cagcccatca ggcaaggctc tgttttctgc 480
attttatccc gtttgattct tctcgttagg attggagcaa ataatttcaa tatgttcttc 540
gctggcttta tcatagtgac ccttcattta aagggacttt taacaattga cttaaagaac 600
actgagatgt gatattttat tgggatttga aagttgccat tgggttttac cttccttaat 660
t 661

<210> 220
<211> 792
<212> DNA
<213> Homo sapien